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Bureau of Land Management

Grand Staircase-Escalante National Monument

Draft Management Plan
Draft Environmental Impact Statement

November 1998

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UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

DRAFT MANAGEMENT PLAN
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Prepared by

Grand Staircase-Escalante National Monument
Cedar City, Utah

November 1998

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1600
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Dear Reader:

This Draft Management Plan (DMP)/Draft Environmental Impact Statement (DEIS) for Grand Staircase-Escalante National Monument is presented for your review and comment. This document analyzes alternatives for managing public lands within the Monument. These alternatives are designed to guide future management and resolve land management issues identified during the early stages of the planning process.

We welcome your comments on the content of this document. We are particularly interested in comments that address one or more of the following: (1) possible flaws in the analysis; (2) new information that would have a bearing on the analysis; and (3) needs for clarification. Specific comments will be most useful. Those comments addressing the adequacy of the DMP/DEIS will be responded to in the Proposed Management Plan (PMP)/Final Environmental Impact Statement (FEIS).

In order to be considered in the PMP/FEIS, comments must be received within 90 days of the *Federal Register* notice of availability. Written comments will be accepted until February 12, 1999.

Open houses will be held at the following locations:

•Kanab, UT	Kanab Middle School	12/1/98
•Albuquerque, NM	Winrock Inn 18 Winrock Center, N.E.	12/1/98
•Escalante, UT	Escalante High School	12/3/98
•Denver, CO	Hyatt Regency Tech Ctr. (7800 Tufts Avenue)	12/3/98
•Salt Lake City, UT	Salt Lake Hilton (150 W. 500 S.)	12/8/98
•Tropic, UT	Bryce Valley High	12/8/98
•San Francisco, CA	San Francisco Marriott (55 Fourth Street)	12/10/98
•Big Water, UT	Big Water Town Hall	12/10/98
•Orderville, UT	Valley High School	1/5/99
•Panguitch, UT	Panguitch High School	1/5/99
•Flagstaff, AZ	Flagstaff Radisson Woodlands Plaza (1175 West Route 66)	1/7/99
•Cedar City, UT	SUU - Charles Hunter	1/7/99
•Washington D.C.	The Capital Hilton 16th & K Streets, N.W.	1/12/99

Please keep this copy of the DMP/DEIS, as you may wish to refer to it when you review the final document. Copies of the PMP/FEIS will be sent to those who provide comments on the DMP/DEIS or request a copy.

All written comments should be sent to:

Mr. Pete Wilkins, Team Leader
Grand Staircase-Escalante National Monument
337 South Main Street, Suite 010
Cedar City, UT 84720

Sincerely,

A. J. Meredith
Monument Manager

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT MANAGEMENT PLAN and ENVIRONMENTAL IMPACT STATEMENT

(X) Draft Environmental Statement ( ) Final Environmental Statement

Department of the Interior, Bureau of Land Management

Type of Action: (X) Administrative ( ) Legislative

Abstract: This Draft Management Plan/Draft Environmental Impact Statement describes and analyzes the impacts of five alternatives for managing the public lands within the Monument. The alternatives provide objectives and recommendations to protect and manage Monument resources. Alternative B is BLM's preferred alternative.

Comments: Comments on this document are requested from all interested and/or affected agencies, organizations, and individuals. Comments must be received within 90 days of the *Federal Register* notice of availability. Written comments will be accepted until February 12, 1999.

For further information contact:

Mr. Pete Wilkins, Team Leader
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USER'S GUIDE

The Grand Staircase-Escalante National Monument Draft Management Plan and Draft Environmental Impact Statement is divided into five chapters, with maps, a summary, appendices, glossary, references, and an index.

The **Summary** is a synopsis of the Draft Management Plan and Draft Environmental Impact Statement (DEIS).

Chapter 1 (Purpose and Need) contains introductory material for the Draft Management Plan/DEIS. It describes the purpose and need for the preparation of the document and identifies the issues that will be addressed. It also describes the planning and scoping process and outlines the planning criteria.

Chapter 2 (Description of the Alternatives) is divided into the following sections: Introduction, Alternative A (No Action), Alternative B (Preferred), Alternative C, Alternative D, Alternative E, Management Common to All Alternatives, and Alternatives Considered But Eliminated From Detailed Analysis. The alternatives describe an array of management options for the Monument. Alternatives B through E divide the Monument into management zones. These zones are intended to be used as a management tool specific to each alternative. The zone boundaries for each alternative are different, so zones cannot be compared from one alternative to the other. However, the general management provisions of each of the zones can be compared by alternative. A table comparing the alternatives is found following the description of Alternative E. Maps and tables are found throughout the chapter.

Chapter 3 (Affected Environment) describes the environment that could be affected or impacted by implementing any of the alternatives. It includes a description of the environmental factors and major uses related to the issues. Maps, figures, and tables are found throughout the chapter.

Chapter 4 (Environmental Consequences) describes potential impacts and changes to the affected environment with the implementation of each of the alternatives. The Summary of Environmental Consequences table is found at the end of this chapter.

Chapter 5 (Consultation and Coordination) includes a summarization of public involvement, lists agencies and organizations receiving the document, and provides a List of Preparers for the Draft Management Plan/DEIS.

The **Appendices** contain additional information to help in the understanding of the document.

The **Glossary, References, and the Index** provide an aid to the reader in finding and understanding the material contained in this document.

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ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
AMP	Allotment Management Plans
APD	Application for Permit to Drill
ATV	All-Terrain Vehicle
AUM	Animal Unit Month
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CMU	Classification and Multiple Use Act
DEIS	Draft Environmental Impact Statement
DOGM	Utah Division of Oil, Gas, and Mining
FERC	Federal Energy Regulation Commission
FLPMA	Federal Land Policy and Management Act
FWS	Fish and Wildlife Service
GCNRA	Glen Canyon National Recreation Area
IMP	Interim Management Policy
ISA	Instant Study Area
NEPA	National Environmental Policy Act
ONA	Outstanding Natural Area
PFC	Proper Functioning Condition
PSD	Prevention of Significant Deterioration
PWR	Public Water Reserves
R&PP	Recreation and Public Purposes Act
RMIS	Resource Management Information System
RMP	Resource Management Plan
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	Rights-of-Way
SITLA	Utah School Institutional and Trust Lands Administration
TDS	Total Dissolved Solids
TGA	Taylor Grazing Act
TMDL	Total Maximum Daily Load
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
USC	United States Code
USDOI	United States Department of the Interior
USGS	United States Geological Survey
VER	Valid Existing Right
VRM	Visual Resource Management
WSA	Wilderness Study Area

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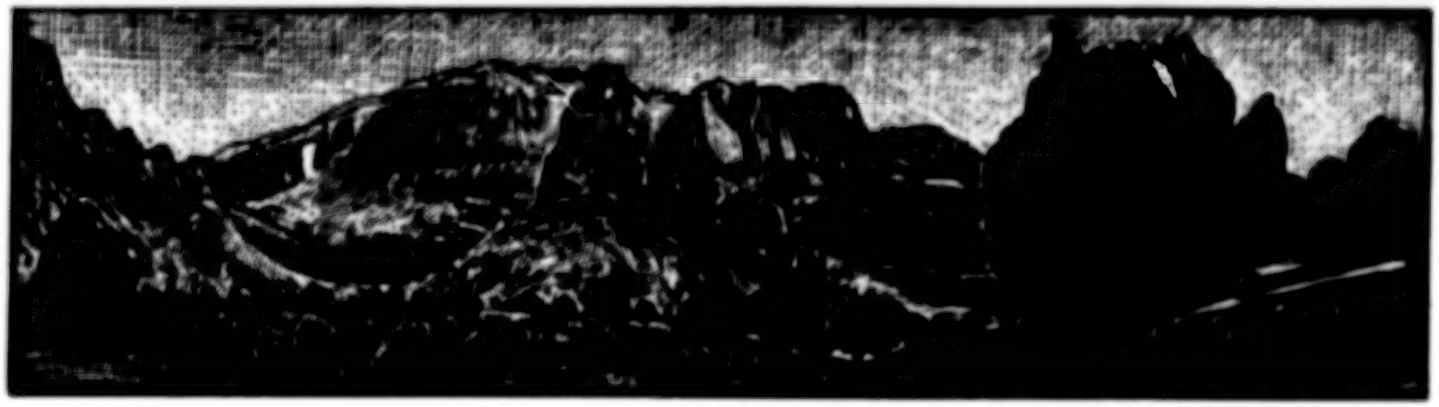
Summary

Grand Staircase-Escalante National Monument



Draft Management Plan
Draft Environmental Impact Statement

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SUMMARY

INTRODUCTION

Grand Staircase-Escalante National Monument was established on September 18, 1996, when President Clinton issued a Proclamation (Appendix 1) under the provisions of the Antiquities Act of 1906 (Appendix 2). The Monument was created to protect a spectacular array of scientific, historic, biological, geological, paleontological, and archaeological objects.

The Proclamation, which is the principal direction for management of the Monument, clearly dictates that the Bureau of Land Management protect these resources. All other considerations are secondary to that edict. The management alternatives presented in this plan are necessarily constrained to those affording the required protection. As a result, the range of alternatives presented in this planning document for the Monument is narrower than is typical of Bureau of Land Management management plans.

ISSUES

For planning purposes, an "issue" is defined as a matter of controversy, dispute, or general concern over resource management activities, the environment, or land uses. In essence, issues help determine what decisions will be made in the plan and what the environmental analysis must address.

Based on the scoping comments received and subsequent analysis and evaluation, seven major planning issues were identified. Those issues are listed below.

Issue 1: How will Monument resources be protected?

Issue 2: How will research associated with the Monument be managed?

Issue 3: How will Monument management be integrated with community plans?

Issue 4: How will people's activities and uses be managed?

Issue 5: What facilities are needed and where?

Issue 6: How will transportation and access be managed?

Issue 7: To what extent is water necessary for the proper care and management of the objects of the Monument, and what further action is necessary to assure the availability of water?

ALTERNATIVES

Five alternative plans for the management of the Monument, including a "no action" alternative, are described in this Draft Monument Management Plan and Draft Environmental Impact Statement.

The four "action" alternatives, Alternatives B, C, D, and E, describe various ways the provisions of the Proclamation would be applied to direct management of the Monument. Each alternative has a somewhat different emphasis, primarily defined in terms of resource focus, but all afford the high degree of protection for Monument resources required by the Proclamation.

Alternative A
(No Action Alternative)

Following the establishment of the Monument, adjustments in management were made to follow the directives of the Proclamation and the Interim Management Guidance issued pursuant to the Proclamation. The No Action Alternative would continue the present management approach, guided by the Proclamation, Interim Guidance, and existing law and policy. The No Action Alternative is required by the National Environmental Policy Act and provides the baseline against which to compare the other alternatives.

The Interim Guidance states that actions not precluded by the Proclamation and not in conflict with the established purposes of the Monument may continue. At the same time, the Interim Guidance precludes or defers actions and decisions that might conflict with the Proclamation until a management plan is in place. The No Action Alternative would continue this baseline approach. It would also continue current levels of research, maintenance, and access consistent with the Proclamation and Interim Guidance. The actions proposed in this alternative can be found in Table S.1.

Alternative B
(Preferred Alternative)

This alternative would emphasize preservation of the Monument as an unspoiled natural area, while recognizing its value as a scientific resource for a variety of research activities. The frontier character of the land would be maintained both as a safeguard for Monument resources and as an inspiration to its visitors. Visitor services would be located primarily in the communities outside the Monument, which would help to provide economic opportunities for the communities and provide protection for Monument resources.

The preferred alternative includes a strong Bureau of Land Management-directed science program, focused on better understanding and preserving the resources of the Monument while assisting in the development of improved land management practices. Recreational use of the Monument would be managed in part by the level of facilities provided, by restrictions on access, and by group size limits. This would be guided by a zoning system designed to maintain the undeveloped nature of Monument lands.

By protecting the undeveloped and unspoiled nature of the Monument, while minimizing further intrusions, the visitor experience would be enhanced and scientific opportunities would be preserved for future generations. The science program itself would include a public education program to increase public understanding of science, the land, and its history. It would emphasize continued collaboration, and employ a Science Advisory Council to advise on the interaction of science, research, and management.

The actions proposed in this alternative can be found in Table S.1.

Alternative C

This alternative would emphasize the exemplary opportunities the Monument presents for scientific research in a wide variety of disciplines. The Bureau of Land Management would aggressively protect the scientific values within the Monument while maximizing research opportunities for the biological, geological, paleontological, archeological, and historic treasures for which the Monument was established. Consistent with all aspects of the Proclamation and the planning criteria, this alternative would emphasize two of the planning criteria: (1) identifying opportunities and priorities for research and education related to the resources for which the Monument was created, and (2) developing an approach for incorporating research into management actions.

Scientific research opportunities would be given priority over other uses, and would be managed across a range of research zones. These zones would allow varying degrees of intrusive and non-intrusive research activities, while leaving certain areas undisturbed for future study. While these zones would offer a range of recreational opportunities for visitors, recreational use of the Monument would be secondary to research use. Visitor management would be directly tied to the interpretation of Monument resources and ongoing research. When feasible, visitors would be directed to sites where research was actively occurring, and directed away from sites where human impacts could adversely affect existing science projects, future research, or Monument resources. Access and surface-disturbing activities would be limited in areas where research potential or Monument resources could be compromised.

In this alternative, research proposals would be required to have a public interpretation and education component. Educators and students would have the opportunity to participate in the Monument science program, and observe or take part in research projects where it would not interfere with research objectives. The Monument would play a role in developing programs for grades Kindergarten through 12, emphasizing the area's scientific and cultural values.

Scientific interpretation would be emphasized at research sites and visitor centers. Results of scientific research and inventory data would be disseminated through interpretive displays, publications, forums, and public exhibition of objects and artifacts.

Communities around the Monument would be expected to realize economic benefits related to supporting an emerging national showcase of scientific exploration, cooperation, and management.

The actions proposed in this alternative can be found in Table S.1.

Alternative D

This alternative would emphasize preservation of the primitive, undeveloped nature of the Monument through the stewardship of intact natural systems. The primal character of the land itself has helped to both create and preserve the important geological, paleontological, archeological, historical, and biological resources of the Monument. This alternative would maximize protection of the natural environment, while enhancing its remote character by limiting travel corridors and visitation.

Visitor use would be focused on the periphery of the Monument, with limited access and visitor use in the interior. A wide variety of developed trails, interpretive sites, and other visitor facilities would be provided at the periphery of the Monument, near local communities. Elsewhere, facilities would be provided only where necessary for public safety or for the protection of Monument resources. Recreational uses would be restricted by group size, permits, and possible allocation. Utility lines, competitive events, and other uses would also be restricted in the remote zones to minimize resource impacts in the interior. The approach of this alternative would provide economic opportunities for local communities by encouraging development of visitor services, such as interpretive centers and campgrounds, outside the Monument.

Research would be an important component of this alternative, and would be encouraged to the extent compatible with supporting the land's primitive and remote character. Researchers would be subject to the same stipulations as other backcountry users, except in limited circumstances where unique and outstanding research opportunities warrant strictly controlled exceptions. Likewise, ground disturbing research, or other research that would conflict with the primitive and remote character of the Monument, would not be allowed, except in cases of unique opportunities with high scientific value.

The actions proposed in this alternative can be found in Table S.1.

Alternative E

This alternative would emphasize and facilitate a full range of developed and undeveloped recreational opportunities for visitors, while relying heavily upon public education and visitor use management to protect Monument resources. Consistent with all aspects of the Proclamation and the planning criteria, this alternative would emphasize the element of managing recreational activities for enjoyment of visitor experiences. It would employ a zoning system designed to provide numerous recreational opportunities, ranging from more developed, directed experiences, to less developed, primitive, and self-directed experiences. The intent would be to maximize recreational opportunities for visitors in a manner consistent with the protection of Monument resources. A proactive visitor services program would put emphasis on information, education, interpretation, and stewardship. Communities would be integral to dispersing information and providing visitor services.

In this alternative, some areas would have routes designated for motorized travel, while other areas would be closed to these uses, emphasizing access by foot or on horseback. To accommodate current and expected visitation, signs and facilities such as developed campgrounds, picnic areas, and interpretive sites would be focused in the more developed areas and along major access routes. Other uses, including utility lines and other rights-of-way, commercial operations, fuelwood cutting, and competitive events, would be managed under permit or other systems to ensure resource protection.

Consistent with the focus on recreation and the visitor experience, recreation activities would generally take precedence over all other permitted land uses in the event that irreconcilable conflicts develop. In carrying out research projects, researchers would be subject to the access criteria established for the various zones; only limited exceptions for significant research opportunities would be made. Research would be prioritized by zone, with the highest priority placed on researching highly disturbed areas. Priority would also be given to projects with an outreach and education component aimed at promoting stewardship of Monument resources.

The actions proposed in this alternative can be found in Table S.1.

MANAGEMENT COMMON TO ALL ALTERNATIVES

There were several other important issues raised in scoping which are of concern to the public, but which have already been decided by the Proclamation, or are governed by existing laws and regulations. Because management of these issues has already been determined through the Proclamation, law, or regulation, management alternatives for those issues are not presented in this plan. Nevertheless, those issues are discussed in detail in the "Management Common to All Alternatives" section in Chapter 2.

Some of the issues discussed in the Management Common to All Alternatives section of Chapter 2 include:

- Management of livestock grazing
- Management of Wilderness Study Areas
- Management of valid existing rights (e.g., mining claims, mineral leases)
- Management of fish and wildlife (including hunting and fishing) by the State of Utah
- Management of existing withdrawals, reservations, and appropriations

SUMMARY

TABLE S.1
ALTERNATIVE COMPARISON

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Monument Resources					
Vegetation manipulation	• maintain existing or allow new only to protect or enhance Monument resources • management ignited fire used to restore natural systems or to reduce hazardous fuels	• the following methods could be used throughout the Monument (except as noted) to restore natural systems and to protect sensitive resources: -mechanical (prohibited on 1,038,788 acres) -chemical -biological -hand cutting -management ignited fire	• the following would be allowed on all but 230,526 acres: -mechanical (prohibited on an additional 952,352 acre.) -chemical -biological -hand cutting -management ignited fire	• the following would be allowed for the protection of sensitive resources throughout the Monument: -limited chemical -hand cutting -management ignited fire to reduce hazardous fuel	• allowed as needed on 218,358 acres: -mechanical -chemical -biological -hand cutting -management ignited fire • management ignited only on 363,437 acres • management ignited fire and hand cutting on 428,329 acres • no methods allowed on 674,775 acres
Wild and Scenic Rivers	• suitability determinations would not be made on 25 eligible river segments (330 miles)	• 17 of the 25 eligible river segments (252 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS	• none of the 25 eligible river segments (330 miles) would be determined suitable	• all 25 eligible river segments (330 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS	• 17 of the 25 eligible river segments (252 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS
Research					
Non-surface disturbing research	• continue to support • continue to identify opportunities and priorities	• allowed and encouraged throughout the Monument • conduct or support research related to improvement of land management practices, disturbance ecology (502,237 acres) • permits required	• encouraged throughout the Monument	• allowed and encouraged, with permit, throughout the Monument	• encouraged at visitor sites to protect resources and use as an interpretive tool on 581,795 acres • priority for inventory and field studies on 1,103,104 acres

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SUMMARY

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Surface disturbing research	• allowed but cannot result in the impairment of wilderness suitability	• allowed where necessary, with mitigation on 646,111 acres • allowed only in cases of unique opportunity with extremely high value, with mitigation on 1,038,788 acres • permits required	• allowed for scientific purposes on 151,029 acres • accommodate some on 350,992 acres • generally not allowed but exceptions made for unique research opportunities on 1,182,878 acres	• allowed with permit and appropriate mitigation on 113,814 acres • allowed only if it cannot be done elsewhere or if it directly relates to or is dependent on remoteness on 1,571,085 acres	• permitted if done as an interpretive tool on 218,358 acres • permitted on 1,466,541 acres only if it cannot be done elsewhere
Facilities and Use Management					
Parking area and trailhead construction	• allowed, as needed, for resource protection	• allowed for a variety of purposes including visitor needs, to protect sensitive resources, or for public safety • not allowed in the majority of the Monument	• allowed in the more developed areas • not allowed in the majority of the Monument	• allowed in the more developed areas • not allowed in the majority of the Monument	• allowed for a variety of purposes including visitor needs or to protect sensitive resources • not allowed in the much of the Monument
Signing	• continue to provide as needed	• allowed for directional, safety, interpretive, and for the protection of resources	• allowed for directional, safety, interpretive, and for the protection of resources	• allowed for directional, safety, interpretive, and for the protection of resources	• allowed for for directional, safety, interpretive and for the protection of resources
Interpretative sites and picnic areas	• none identified, develop as needed	• interpretive sites allowed to highlight resources and for resource protection • picnic areas generally not allowed, allowed only as needed	• encouraged as needed in the developed areas • allowed for resource protection • not allowed on the majority of the Monument	• range from allowed to not allowed depending on area	• provide as needed in developed areas • not allowed on the majority of the Monument
Toilets	• allowed where needed to address health and safety concerns	• provided in the more developed areas • not provided elsewhere	• provide as need in developed areas • provide temporary facilities to accommodate research	• range from allowed to not allowed depending on area	• range from allowed to not allowed depending on area
Camping	• dispersed camping allowed on 1,684,899 acres	• dispersed camping allowed on 1,571,162 acres • dispersed camping not allowed on 113,737 acres	• dispersed camping allowed on 1,664,887 acres • camping in designated primitive sites only on 20,012 acres	• dispersed camping allowed on much of the Monument • camping in designated primitive campsites in some areas only	• dispersed camping allowed on much of the Monument

SUMMARY

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Campfires	• campfires allowed on 1,684,899 acres	• allowed in fire grates or mandatory fire pans on 143,785 acres • allowed, fire pans encouraged on 1,521,102 acres • campfires not allowed on 20,012 acres	• allowed on 712,535 acres • not allowed on 972,364 acres	• allowed in fire grates or mandatory fire pans on 1,664,887 acres • not allowed on 20,012 acres	• allowed in fire grates or mandatory fire pans on 63,273 acres • allowed, fire pans encouraged on 1,601,614 acres • campfires not allowed on 20,012 acres
Group size	• no group limit • recommended group limit of 12 in Escalante Canyons	• group limit of 25 people and/or animals on 143,785 acres • group limit of 12 people and/or animals on 1,541,114 acres	• group limit of 50 people and/or animals on 712,535 acres • group limit of 12 people and/or animals on 972,364 acres	• group limit of 25 people and/or animals on 113,814 acres • group limit of 12 people and/or animals on 1,571,085 acres	• no limit on 28,133 acres • group limit of 75 people and/or animals on 190,225 acres • group limit of 12 people and/or animals on 1,466,541 acres
Allocation	• no allocations	• could be implemented on 1,571,162 acres • would not allocate on 113,737 acres	• could be implemented on 1,684,899 acres	• could be implemented on 1,684,899 acres	• could be implemented on 1,466,541 acres • would not allocate on 218,358 acres
Competitive and special events	• continue to manage permits approved in 1997 (2)	• not allowed on 1,684,899 acres	• allowed on 502,021 acres • not allowed on 1,182,878 acres	• allowed on 113,814 acres • not allowed on 1,571,085 acres	• allowed on 218,358 acres • not allowed on 1,466,541 acres
Outfitters/guides	• allow existing permits • no new permits	• allowed if outfitter/guide activities are appropriate to the zone on 1,684,899 acres	• allowed if outfitter/guide activities are appropriate to the zone on 1,454,373 acres • not allowed on 230,526 acres	• allowed on 1,684,899 acres but must comply with constraints of zone and allocation and use limits • some sites may require a guide	• allowed if outfitter/guide activities are appropriate to the zone on 1,684,899 acres

SUMMARY

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Communication sites and utility rights-of-way (pipelines, power lines, etc.)	• issue only those necessary on 1,684,899 acres	• communication sites (and buried and aerial lines) allowed on 646,111 acres, but must comply with zone restrictions • communication sites (no buried or aerial lines permitted) on 1,038,788 acres	• allowed on 502,021 acres • not allowed on 1,182,878 acres	• allowed on 113,814 acres • not allowed on 1,571,085 acres	• allowed on 646,687 acres but must blend with the landscape • not allowed on 1,038,212 acres
Filming	• allowed on 1,684,899 acres	• minimum impact only allowed on 646,111 acres • not allowed on 1,038,788 acres	• not allowed on 1,684,899 acres	• minimum impact only allowed on 113,814 acres • not allowed on 1,571,085 acres	• minimum impact only allowed if used as an interpretive tool on 1,684,899 acres
Transportation and Access					
Access routes	• 2,176 miles of routes open	• 818 miles of routes designated open for street legal vehicles • 591 miles of those routes open for street legal are also open for non-street legal ATV and dirt bike use • 229 miles of routes open for administrative purposes	• 1,187 miles of routes designated open for street legal vehicles • non-street legal ATV and dirt bike use prohibited • 180 miles of routes open for administrative purposes	• 760 miles of routes designated open for street legal vehicles • non-street legal ATV and dirt bike use prohibited • 30 miles of routes open for administrative purposes	• 1,264 miles of routes designated open for street legal vehicles • 980 miles of those routes open for street legal are also open for non-street legal ATV and dirt bike use • 84 miles of routes open for administrative purposes
Trail construction	• allowed	• trails developed for a variety of purposes: -fully accessible -focus on day-use opportunities -public safety -to protect sensitive resources	• allowed for research and resource protection • not allowed in the majority of the Monument	• trails developed for a variety of purposes: -fully accessible -day-use opportunities -to protect sensitive resources	• trails developed for a variety of purposes: -fully accessible -day-use opportunities -backcountry trails -to protect sensitive resources • not allowed in the majority of the Monument
Trail maintenance	• continue as needed	• allowed as needed and to protect sensitive resources	• allowed in general and for resource protection	• allowed in general • minimum maintenance	• allowed as needed

ENVIRONMENTAL CONSEQUENCES

The analysis of the alternatives is based on certain assumptions about each alternative. Those assumptions, by alternative, are summarized below. A tabular summary of impacts by alternative is found in Table S.2.

Alternative A (No Action)

The majority of the Monument, 1,363,477 acres, would remain open to cross-country vehicle use. On about 15 percent of the Monument, 256,802 acres, cross-country vehicle use would be limited to existing routes. Four percent, 64,619 acres, would be closed to cross-country vehicle use.

It is assumed that a variety of visitor use sites would be constructed or existing sites would be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 16 sites would be constructed or expanded, disturbing 8 acres.

It is assumed that the development plan for Calf Creek campground would be completed, adding a group site to that campground. The existing 21 designated primitive campsites within the Monument would continue to be used.

There would be no group size restrictions under this alternative. It is assumed that impacts from visitor use would be very high in this alternative.

New water development facilities (spring developments, troughs, pumps, pipelines, impoundments) would be constructed when needed to protect Monument resources. Maintenance of existing water developments for livestock, wildlife and visitor use would continue, subject to compliance with current policies and practices, provided Monument resources were protected.

Alternative B (Preferred)

Motorized and mechanized cross-country travel would be prohibited. Approximately 818 miles of routes would be designated open to the public for street legal motorized and mechanized use. On 591 of the 818 miles open to motorized and mechanized use, non-street-legal ATV and dirt bike use would be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 32 sites would be constructed or expanded, disturbing 16 acres.

No developed campgrounds would be constructed. Nine primitive campsites could be designated, disturbing 18 acres.

The group size limit on 143,874 acres would be 25 people and/or animals (without a permit). On 1,541,025 acres, the group size limit would be 12 people and/or animals. Allocations could be used to maintain use at low levels on 1,571,162 acres.

New water developments could be constructed when such facilities were determined necessary to protect Monument resources. Maintenance of existing water developments could continue, subject to an evaluation of impacts to Monument resources.

Alternative C

Motorized and mechanized cross-country travel would be prohibited. Approximately 1,187 miles of routes would be designated open to the public for street-legal motorized and mechanized use. Non-street legal ATVs and dirt bikes would not be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 20 sites would be constructed or expanded, disturbing 10 acres. No developed campgrounds would be constructed. Thirteen primitive campsites could be designated, disturbing 26 acres.

The group size limit on 712,535 acres would be 50 people and/or animals. On 972,364 acres, the group size limit would be 12 people and/or animals. Allocations could be used to maintain use levels throughout the Monument on 1,684,899 acres.

New water developments could be constructed when such facilities were determined necessary to protect Monument resources. Maintenance of existing water developments could continue, subject to an evaluation of impacts to Monument resources.

Alternative D

Motorized and mechanized cross-country travel would be prohibited. Approximately 760 miles of routes would be designated open to the public for street legal motorized and mechanized use. Non-street legal ATVs and dirt bikes would not be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 20 sites would be constructed or expanded, disturbing 10 acres.

No developed campgrounds would be constructed. Thirteen primitive campsites could be designated, disturbing 26 acres.

The group size limit on 113,814 acres would be 25 people and/or animals. On 1,571,085 acres, the group size limit would be 12 people and/or animals, with limited exceptions in specific areas. Allocations could be used to maintain use levels throughout the Monument on 1,684,899 acres.

New water developments would not be permitted. Maintenance of existing water developments could continue, subject to an evaluation of impacts to Monument resources.

Alternative E

Motorized and mechanized cross-country travel would be prohibited. Approximately 1,264 miles of routes would be designated open to the public for street-legal motorized and mechanized use. On 980 miles of the 1,264 miles designated open to street legal motorized and mechanized use, non-street legal ATV and dirt bike use would be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 43 sites would be constructed or expanded, disturbing 22 acres.

One developed campground could be constructed and three primitive campsites could be designated. Construction of these areas could disturb up to 21 acres.

There would be no group size limitations on 28,133 acres. Group size limits on 190,225 acres would be 75 people and/or animals (without a special permit). On 1,466,541 acres, the group size limit would be 12 people and/or animals. Allocations could be used to maintain use levels on 1,466,541 acres.

New water development facilities could be constructed when needed to protect Monument resources or to manage livestock, wildlife, recreation or watershed resources. Maintenance of existing water develiipments for livestock, wildlife and visitor use could continue, subject to compliance with current policies and practices, provided Monument resources were protected.

TABLE S.2
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on paleontological resources	Paleontological resources could be affected in this alternative more so than in Alternatives B, C, D, or E, as it affords the least amount of visitor management options. Most of the degrading impacts would result from few restrictions on motorized and mechanized cross-country travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,571,162 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,684,899 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,684,899 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,264) miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,466,541 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on archaeological and historic resources	Archaeological and historic resources could be impacted in this alternative more so than in the other alternatives, as it affords the fewest visitor management options. Most of the degrading impacts would result from motorized and mechanized cross-country travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated during any ground disturbing activity. No limits on group sizes could also result in degradation of cultural and historic resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated during any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 1,541,025 acres) and visitor number limitations (on 1,571,162 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated prior to any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 972,364 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated prior to any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 1,571,085 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated prior to any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 1,466,541 acres) and visitor number limitations (on 1,466,541 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impact from research uses and water developments would be mitigated

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on vegetation	Vegetation could be impacted by this alternative to a much greater degree because it lacks restrictions on cross-country vehicle use. Up to 8 acres could be disturbed by reasonably foreseeable actions. The potential for impacts to vegetation from increases in visitation would be likely because of no use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 34 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from increases in visitation would be partially mitigated through group size (on 1,541,025 acres) and visitor number limitations (on 1,571,162 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from increases in visitation would be partially mitigated through group size (on 972,364 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from visitation increases would be partially mitigated through group size (on 1,571,085 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 43 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from visitation increases would be partially mitigated through group size (on 1,466,541 acres) and visitor number limitations (on 1,466,541 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on threatened and endangered plant species	Impacts to 1,691 acres of known Jones' Cycladenia populations and habitat and 2,851 acres of Kodachrome bladderpod populations and habitat could occur from off-highway vehicle travel. Ute ladies'-tresses populations and habitat (64 acres) were closed to off-highway vehicle travel. There would be no significant impacts to Kodachrome bladderpod and Jones' Cycladenia from increased visitor use. Impacts to Ute ladies'-tresses populations and habitat could occur from unregulated visitor use. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on relict vegetation	Most relict vegetation would not be protected from cross-country vehicle travel, although it is unlikely that these areas would be receive any use. Unrestricted use by visitors has the potential to impact these communities. No visitor facilities would be constructed in these areas Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.
Impacts on riparian resources	Impacts could occur in riparian areas from the lack of restrictions on visitor use. Riparian resources could be impacted by cross-country vehicle travel. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. The lack of group size limits and other visitor allocations could continue to adversely impact some riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts of weeds	This alternative would have the greatest potential for the spread of weeds. In part because much of the Monument would remain open to cross-country vehicle travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation could occur because no limitations would be applied. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on cryptobiotic soils	Impacts to cryptobiotic soils would come from unregulated cross-country vehicle travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils could come from unregulated visitor use. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on wildlife	Impacts to wildlife would occur from increased interactions with humans and potential habitat degradation from continued cross-country vehicle use. Up to 9 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Increased visitation with no group limits or allocations could impact wildlife. Animal damage control activities would directly impact targeted wildlife species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control efforts would impact targeted wildlife populations only after other means of control have been exhausted. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control efforts would impact targeted wildlife populations only after other means of control have been exhausted. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control activities would not be allowed reducing impacts on wildlife populations that would otherwise be targeted. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control efforts would impact targeted wildlife populations except where they conflict with management objectives for visitor use or fish and wildlife. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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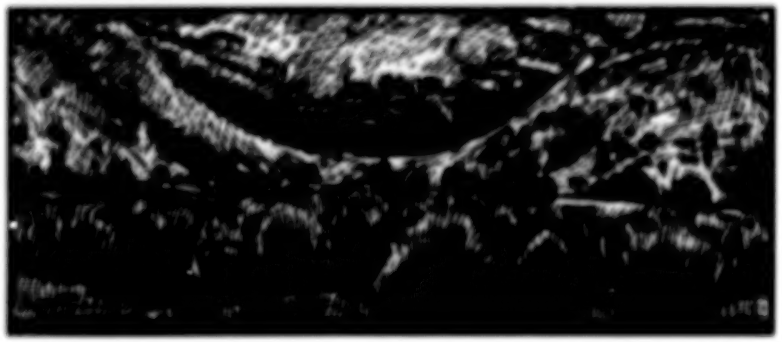
SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on threatened and endangered animal species	There are currently no known conflicts with threatened or endangered animal species. Lack of cross-country vehicle travel restrictions could allow the potential for impacts to threatened and endangered animal species. Up to 8 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to construction. If species were present, no construction would be allowed. If increased visitation were found to have impacts on threatened or endangered species, measures would be taken to protect the species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on the Paunsaugunt deer herd	Much of the Paunsaugunt deer herd habitat would remain open to cross-country vehicle travel, increasing access into the area. This could result in deer being subjected to human interference and physiological stress during their most biologically sensitive periods. Construction of visitor facilities would be minimal. Use in the herd area is expected to remain low.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.



ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on surface water quality	Lack of cross-country vehicle travel restrictions would allow potential impacts to surface water quality to continue. Up to 8 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in a manner that sediment or other contaminants would not be introduced into water sources. Increases in unregulated visitation would add to surface water quality impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (780 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on air quality	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	BLM would pursue a PSD Class I air quality redesignation for the Monument. This would provide long-term air quality protection for the Monument, although the presence of Class I areas surrounding the Monument could have the same effect. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.
Impacts on wild and scenic river values	A determination for suitability on the 25 eligible river segments (330 miles) would not be made. The segments would not be recommended to congress for designation into the NWSRS and would not receive the degree of protection that designation would provide. Protective management would continue indefinitely.	17 (252 miles) of the 25 eligible river segments would be determined suitable for recommendation to Congress for designation into the NWSRS. There would be no adverse impacts from planned actions anticipated for any segments determined suitable. The suitable segments would be managed for the preservation of the outstandingly remarkable values, under the direction of the plan. The 8 segments determined unsuitable would be managed under the direction and prescriptions of the plan.	All 25 of the eligible river segments (330 miles) would be determined unsuitable. The segments would not be recommended to congress for designation into the NWSRS and would not receive the degree of protection that designation would provide. The 25 segments determined unsuitable would be managed under the direction and prescriptions of the plan.	All 25 eligible river segments (330 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS. There would be no adverse impacts from planned actions anticipated for any segments determined suitable. The suitable segments would be managed for the preservation of the outstandingly remarkable values, under the direction of the plan.	17 (252 miles) of the 25 eligible river segments would be determined suitable for recommendation to Congress for designation into the NWSRS. There would be no adverse impacts from planned actions anticipated for any segments determined suitable. The suitable segments would be managed for the preservation of the outstandingly remarkable values, under the direction of the plan. The 8 segments determined unsuitable would be managed under the direction and prescriptions of the plan.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on research activities	Provides the greatest access for research and the least protection for the research value of Monument resources. Animal damage control activities would impact some research related to wildlife populations and natural systems.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 1,047 mile network of designated public and administrative routes would be open to motorized and mechanized use. Animal damage control activities would impact some research related to wildlife populations and natural systems when other measures have been exhausted.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 1,367 mile network of designated public and administrative routes would be open to motorized and mechanized use. Animal damage control activities would impact some research related to wildlife populations and natural systems when other measures have been exhausted.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 790 mile network of designated public and administrative routes would be open to motorized and mechanized. Animal damage control activities would not be permitted.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 1,348 mile network of designated public and administrative routes would be open to motorized and mechanized use. Animal damage control activities would impact some research related to wildlife populations and natural systems except when such activities affect management objectives for visitor use or wildlife and fish.
Impacts on livestock operations	Cross-country motorized travel and access on existing routes would facilitate livestock management operations. Greater access to the general public could increase the chance of damage to range improvement or harassment of livestock. Construction of new water developments to protect Monument resources could also have a beneficial impact on livestock operations. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 1,347 miles. Construction of new water developments to protect Monument resources could also facilitate achieving resource condition objectives for grazing. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 1,367 miles. Construction of new water developments to protect Monument resources could also facilitate achieving resource condition objectives for grazing. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 790 miles. Construction of new water developments would not be permitted, limiting the range of options available to livestock operators to achieve resource condition objectives. Animal damage control activities would not be permitted which could impact livestock operations by increasing predation losses.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 1,348 miles. Construction of new water developments for purpose of protecting Monument resources or to enhance management of livestock, wildlife, recreation or watershed resources could also facilitate achieving resource condition objectives. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on forestry product use	Cross-country vehicle access would not be restricted in fuelwood collection areas, facilitating the collection of these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.
Impacts on recreational use	This alternative would result in the greatest number of unrestricted uses, with the fewest developments to support these uses. Much of the Monument would remain open to cross-country vehicle travel. More routes would be open to travel in this alternative. Visitors would be accommodated in with the construction of 16 new visitor facilities. Crowding would likely occur in developed areas and on trails. Lack of group size limits would impact visitor experience due to the noise and visual impacts of large groups. Animal damage control activities would directly and indirectly impact visitor experiences.	Visitors would be provided with opportunities for both developed and primitive experiences with this alternative. Visitors would be able to experience the Monument on the 818 miles of designated routes would be open to motorized and mechanized use. ATV and dirt bike users would be accommodated on the 591 miles of the 818 miles that would be designated open for non-street legal ATV and dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitors would be accommodated in this alternative with the construction of 32 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.	Visitors would be able to experience the Monument on the 1,187 miles of designated routes would be open to motorized and mechanized use. No routes would be designated for non-street legal ATV or dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitor experiences would be facilitated by the addition of 20 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.	This alternative is the most restrictive, but would provide visitors with the greatest opportunities for primitive experiences. Visitors would be able to experience the Monument on the 760 miles of designated routes would be open to motorized and mechanized use. No routes would be designated for non-street legal ATV or dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitor experiences would be facilitated by the addition of 20 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.	The widest range of visitor experiences would be afforded with this alternative. Visitors would be able to experience the Monument on the 1,264 miles of designated routes would be open to motorized and mechanized use. ATV and dirt bike users would be accommodated on the 980 miles of the 1,264 miles that would be designated open for non-street legal ATV and dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitors would be most accommodated in this alternative with the construction of 43 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on outfitters and guides	Existing outfitters and guide permits would likely benefit the most from this alternative. Although they would not be able to expand their operations.	Outfitters and guides would benefit because they would be allowed to operate throughout the Monument. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.	Outfitters and guides would be allowed to operate throughout most of the Monument. These users would be subject o the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.	Outfitters and guides would be allowed to operate throughout the Monument. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.	Outfitters and guides would benefit because they would be allowed to operate throughout the Monument. This alternative provides the fewest restrictions. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.
Impacts on scenic quality	Continued cross-country vehicle use could create noticeable intrusions detracting from the scenic quality. Surface disturbance from construction of visitor facilities would be 8 acres. The visual resource contrast rating system would be used to decrease impacts. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (780 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on primitive unconfined values	Lack of cross-country vehicle restrictions and unlimited access in this alternative would affect primitive unconfined values. Large portions of the Monument would not be protected from the sights and sounds of motorized and mechanized recreation. The construction of visitor site facilities could concentrate visitor use at the developed sites and reduce impacts on primitive and unconfined values in the rest of the Monument. Not limiting group size could increase impacts on naturalness if groups concentrate on trails and in campsites. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (1,214 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.

SUMMARY

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on local economies	The annual growth rate in visitation would be 4.7 percent in this alternative, with 217,190 visitor days in 1998, growing to 414,764 visitor days in 2012. Regional population growth attributable to this alternative would be 370 people in 2012. By 2012, the additional employment generated by this alternative would be 219 jobs, with employee earnings reaching $6,001,000 in that year. Local government revenues attributable to this alternative would be $516,000 in 2012, with expenditures of $317,000, for a net revenue of $199,000 to local governments.	The annual growth in visitation in this alternative would be 5.2 percent, with 442,633 visitor days in 2012, 6.7 percent higher than Alternative A. Regional population growth attributable to this alternative would be 422 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 248 jobs, compared to 219 in Alternative A. Employee earnings would reach $6,636,000 in 2012, 10.6 percent higher than Alternative A. Local government revenues attributable to this alternative would be $ 598,000 in 2012, with expenditures of $362,000, for a net revenue of $236,000 to local governments, 18.6 percent higher than in Alternative A.	The annual growth in visitation in this alternative would be 3.7 percent, with 358,274 visitor days in 2012, 13.6 percent lower than Alternative A. Regional population growth attributable to this alternative would be 282 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 163 jobs, compared to 219 in Alternative A. Employee earnings would reach $3,828,000 in 2012, 36 percent less than Alternative A. Local government revenues attributable to this alternative would be $288,000 in 2012, with expenditures of $245,000, for a net revenue of $236,000 to local governments, 78 percent lower than in Alternative A.	The annual growth in visitation in this alternative would be 1.2 percent, with 248,055 visitor days in 2012, 40 percent lower than Alternative A. Regional population growth attributable to this alternative would be 6 people in 2012, compared to 370 people in Alternative A. By 2012, this alternative would show a net loss of 1 job, compared to an increase of 219 jobs in Alternative A. Employee earnings would reach $1,480,000 in 2012, 75 percent less than Alternative A. Local government revenues attributable to this alternative in 2012 would be less than expenditures, for a net revenue deficit of $36,000.	The annual growth in visitation in this alternative would be 6.3 percent, with 519,208 visitor days in 2012, 25 percent higher than Alternative A. Regional population growth attributable to this alternative would be 544 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 324 jobs, compared to 219 in Alternative A. Employee earnings would reach $7,963,000 in 2012, 32.7 percent higher than Alternative A. Local government revenues attributable to this alternative would be $792,000 in 2012, with expenditures of $462,000, for a net revenue of $330,000 to local governments, 65.8 percent higher than in Alternative A.
Cumulative Impacts	When coupled with the anticipated effects of population growth and growth in tourism, a high and ever-increasing level of environmental impact on Monument resources would occur.	Implementation of any of Alternatives B, C, D, or E would have substantially less impact than Alternative A. The degree of actual impact that would occur as a result of each alternative would depend, in part, on application of use limits to control visitor use. Assuming those limits were consistently applied among alternatives, Alternative D would have the least impact, followed by Alternative B. Alternatives C and E would have substantially more impact than either D or B, both on the Monument and on the human environment.			

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Chapter 1

Purpose and Need for the Plan

CHAPTER 1 - PURPOSE AND NEED

PURPOSE AND NEED FOR THE PLAN

INTRODUCTION

Grand Staircase-Escalante National Monument was established on September 18, 1996, when President Clinton issued a Proclamation (Appendix 1) under the provisions of the Antiquities Act of 1906 (Appendix 2). The Monument was created to protect a spectacular array of scientific, historic, biological, geological, paleontological, and archaeological objects. These treasures, individually and collectively, in the context of the natural environment that supports and protects them, are the "Monument resources" discussed throughout this plan. The terms "Monument values" and "Monument objects" have also been used, but because the term "Monument resources" may be more easily understood, it will be used throughout this document.

The Proclamation, which is the principal direction for management of the Monument, clearly dictates that the Bureau of Land Management (BLM) protect these resources. All other considerations are secondary to that edict. The management alternatives presented in this plan are necessarily constrained to those affording the required protection. As a result, the range of alternatives presented in this planning document for the Monument is narrower than is typical of BLM management plans.

The Proclamation governs how the provisions of the Federal Land Policy and Management Act (FLPMA) will be applied within the Monument. FLPMA directs the BLM to manage public land on the basis of multiple use and "in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resource, and archeological values." The term "multiple use" refers to the "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment." Multiple use involves managing an area for various benefits, recognizing that the establishment of land use priorities and exclusive uses in certain areas are necessary to ensure that multiple uses can occur harmoniously across a landscape.

The Proclamation, FLPMA, and other mandates provide the direction for the preparation of this management plan. Within this guidance, many decisions remain about how best to protect Monument resources and address the major issues surrounding Monument management.

The Presidential Proclamation directed the Secretary of the Interior to prepare a plan in order to begin making those decisions. The plan will guide management activities within the Monument and allow for the use and protection of Monument resources. It will achieve these goals in a manner that creates opportunities for public exploration and education, sets a precedent for progressive public land stewardship, incorporates input from the scientific community and the public at large, and reflects the national significance of these resources, consistent with the Monument's contribution to our natural and cultural heritage. The results of the Monument planning process to date are presented in this Draft Management Plan/Draft Environmental Impact Statement (DEIS).

PLANNING PROCESS

The Presidential Proclamation directed that a Monument Management Plan be completed by September 1999. To meet this objective, the BLM established a planning team based in Cedar City, Utah. In order to more fully include the State of Utah and local governments in this effort, Secretary Babbitt invited Governor Leavitt to nominate several members of the planning team. The Governor proposed five professionals who became part of the planning team. The 15 member planning team was assembled in the spring of 1997 to begin this inclusive planning process designed to guide the Monument into the next century.

The purpose of this plan is to provide both a set of decisions outlining management and to create a framework for future planning and decision-making. It is expected that in the future, there will be a need for subsequent and more detailed planning, which will focus on specific geographic areas or on specific management issues.

In each subsequent activity plan and National Environmental Policy Act (NEPA) document, the BLM will include a description of the desired future condition of the land involved, and will explain how the activities being planned for would contribute to that desired future condition.

Figure 1.1 illustrates the current planning process which is described in the subsequent paragraphs.

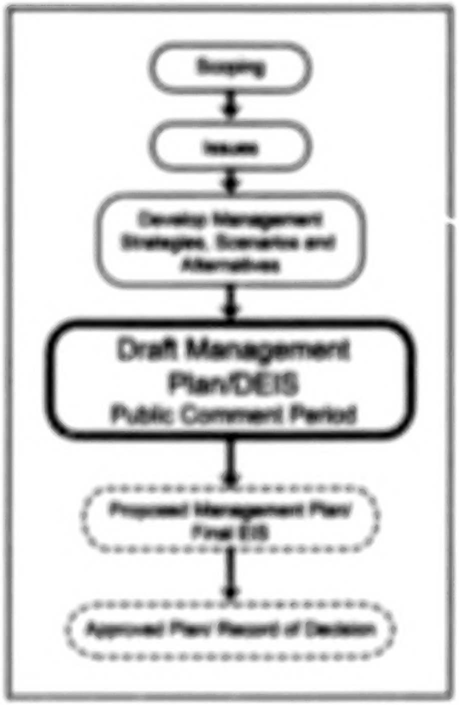
Scoping
Issues
Develop Management Strategies, Scenarios and Alternatives
Draft Management Plan/DEIS
Public Comment Period
Proposed Management Plan/ Final EIS
Approved Plan/ Record of Decision

Figure 1.1 Overveiw of the Planning Process

SCOPING PROCESS

The first step in the planning process was to invite public participation. This "scoping" process invited a wide range of public comment to determine the significant issues to be addressed in the plan. The formal scoping period began with publication of the Notice of Intent to produce a Management Plan, which appeared in the Federal Register on July 8, 1997 (Volume 62, No. 130, Pg. 36570).

The scoping process invited public input through a questionnaire, e-mail, the Internet, and public workshops. Fifteen public workshops were held in seven states and the District of Columbia between August 12 and October 16, 1997. Several thousand scoping comments were received, with comments from all 50 states and the District of Columbia. A complete outline of the scoping process is found in Chapter 5.

ISSUES

One of the most important outcomes of the scoping process was the identification of the significant issues to be addressed in the plan. For planning purposes, an "issue" is defined as a matter of controversy, dispute, or general concern over resource management activities, the environment, or land uses. In essence, issues help determine what decisions will be

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made in the plan and what the environmental analysis must address (via an EIS, as required by NEPA).

Based on the scoping comments received and subsequent analysis and evaluation, seven major planning issues were identified. Those issues are listed below with a short description of why each is significant, as well as decisions regarding each issue that must be made in the plan.

In addition to the seven issues identified in scoping, the plan will address basic environmental and management issues including air quality, water quality, and soils management.

The planning issues identified in scoping are as follows:

Issue 1: How will Monument resources be protected?

The Presidential Proclamation establishing the Monument identified an array of scientific and historic objects to be protected. These geological, paleontological, archeological, biological, and historic objects, individually and collectively, in the context of the natural environment that supports and protects them, are considered Monument resources. The term "Monument values" has also been used. However, the term "Monument resources" may be more easily understood and will therefore be used throughout this document. There are various ways of protecting such resources, including educating visitors, restricting access, setting research priorities, restoring degraded ecological conditions, or some combination of approaches. Decisions about which approaches would be used under each management alternative are outlined in Chapter 2 of this document.

Issue 2: How will research associated with the Monument be managed?

Science and history are at the very heart of the Proclamation establishing the Monument. Grand Staircase-Escalante National Monument provides an opportunity to explore Monument ecosystems, and to conduct social, natural, cultural, and physical science studies. There are many possibilities for managing research to take advantage of such opportunities. Details such as how the scientific agenda for the Monument will be determined, how access for researchers will be managed, and how research will interact with recreation are some of the research issues addressed under each management alternative. The public will have substantial access to research information under every action alternative, but the manner in which that information would be provided varies by alternative.

Issue 3: How will Monument management be integrated with community plans?

Both local and Native American Indian communities near the Monument have contemporary and historic ties to lands within the Monument. These communities make a valuable contribution to our national heritage and to the quality of visitor experience. In addition to dealing with land management issues, the plan discusses the need for continued cooperation between the Monument and these communities.

Issue 4: How will people's activities and uses be managed?

The activities of visitors are recognized as having a profound effect on the Monument environment as well as on local communities surrounding the Monument. Management of those activities is crucial in protecting Monument resources. Decisions such as: where and what kind of interpretation and visitor services to provide, how to manage uses such as rights-of-way, utility lines, outfitter and guide services, communication sites, and fuelwood cutting, and how to reduce conflicts between user groups are all important elements addressed in the alternatives. This plan also addresses the treatment of valid existing rights in place when the Monument was established; that treatment is the same in all alternatives.

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Issue 5: What facilities are needed and where?

Facilities for the Monument include all structures for visitors, administration, and research. As a result of extensive public comment, the plan assumes that a single, large-scale office/visitor center is neither feasible nor desirable, and that major facilities will be located outside the Monument boundaries in communities around the perimeter of the Monument. However, other facility-related decisions are essential to managing visitors and researchers and to protecting Monument resources. These include decisions about the type and location of interpretive sites, campground and day use facilities, the use of temporary facilities, and the type and location of science, research, and administrative facilities.

Issue 6: How will transportation and access be managed?

A network of roads and trails currently provides access to many areas of the Monument. Decisions about improving or restricting access in the Monument are addressed in the management alternatives.

Issue 7: To what extent is water necessary for the proper care and management of the objects of the Monument, and what further action is necessary to assure the availability of water?

The Proclamation directed the Secretary to address "the extent to which water is necessary for the proper care and management of the objects of this monument and the extent to which further action may be necessary, pursuant to Federal or State law, to assure the availability of water." A discussion of those subjects is included in Chapter 2, in Management Common to All Alternatives, and in Chapter 3. Other water related discussions are included in the management alternatives, and as appropriate, throughout the document.

OTHER ISSUES

Management Common to All Alternatives

There are several other important issues raised in scoping which are clearly of concern to the public, but which have already been decided by the Proclamation, or are governed by existing laws and regulations. Because management of these issues has already been determined through the Proclamation, law, or regulation, management alternatives for those issues are not presented in this plan. Nevertheless, those issues are discussed in detail in the "Management Common to All Alternatives" section in Chapter 2.

Issues discussed in the Management Common to All Alternatives section of Chapter 2 include:

- Management of livestock grazing
- Management of Wilderness Study Areas
- Management of valid existing rights (e.g., mining claims, mineral leases)
- Management of fish and wildlife (including hunting and fishing) by the State of Utah
- Management of existing withdrawals, reservations, and appropriations

Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968, as amended, provides for protection of outstanding river resources. It requires the identification and study of rivers or portions of rivers, and directs Federal agencies to cooperate with state governments. Section 5(d)(1) of the Wild and Scenic Rivers Act provides that wild and scenic river considerations be made during Federal agency planning. Either Congress, or the Secretary of the Interior on the nomination of the Governor of Utah, may designate rivers as part of the National Wild and Scenic Rivers system. It is the responsibility of the BLM to make recommendations and complete appropriate environmental studies through the planning process. Pursuant to this mandate, the Monument planning team has completed an evaluation of river resources inside the Monument. Recommendations on specific river segments can be found in Chapter 2, by alternative.

Alternatives Considered but Eliminated

There were several management alternatives suggested during scoping which were eliminated from detailed analysis because they were not deemed reasonable given the constraints of the Proclamation, or for other reasons. Those alternatives, and the reasons they were eliminated, are discussed in detail in the "Alternatives Considered but Eliminated From Detailed Analysis" section at the end of Chapter 2. They include:

- No Livestock Grazing
- Full Recreation Development
- Maximize Wilderness--Recommendation of Suitable Wilderness for Congressional Designation
- Full Field Mineral Development (Oil and Gas, Coal Development, and Hard Rock Mineral Development)
- Designation of Areas of Critical Environmental Concern
- Natural Ecosystem
- Support Local Communities

DEVELOPMENT OF MANAGEMENT STRATEGIES AND ALTERNATIVES

Defining the planning issues was the first step in narrowing the scope of possible actions that would be carried forward into the planning process. The planning team then developed management strategies aimed at providing viable options for addressing the planning issues. The management strategies provided the building blocks from which the general management scenarios, and eventually, the more detailed management alternatives, were developed. The result of this process is the range of management alternatives provided in this Draft Management Plan/DEIS

SUMMARY OF PLANNING CRITERIA AND CONSIDERATIONS

The process described above was designed to identify a viable range of management alternatives given the comments and issues identified during public scoping. At the same time, the different legal requirements and directives governing the planning process were considered in determining the range of management alternatives and in developing the framework for the Draft Management Plan/DEIS. The following is a summary of key planning considerations:

PROCLAMATION

The Presidential Proclamation (Proclamation 6920, September 18, 1996): The Proclamation (Appendix 1), enacted under the Antiquities Act of 1906 (Appendix 2), established the Monument, described the purposes of the Monument, and made certain provisions for its management, including:

- Federal lands within the Monument are withdrawn from new mineral location or mineral leasing.
- Federal lands within the Monument boundaries will remain in public ownership, unless exchanged for lands that would further protect Monument resources.
- Establishment of the Monument is subject to valid existing rights.
- Establishment of the Monument does not diminish the responsibility and authority of the State of Utah for management of fish and wildlife, including regulation of hunting and fishing, on Federal lands within the Monument.
- Livestock grazing shall continue to be governed by applicable laws and regulations other than the Proclamation.
- Existing withdrawals, reservations, or appropriations are not revoked by the

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Proclamation, but such uses must be managed to protect Monument resources.

- Water is not reserved as a matter of Federal law. The plan must address the extent to which water is necessary for the proper care and management of the objects of the Monument and the extent to which further action may be necessary pursuant to Federal or State law to assure the availability of water.

FEDERAL LAND POLICY AND MANAGEMENT AND NATIONAL ENVIRONMENTAL POLICY ACTS

The Federal Land Policy and Management Act (FLPMA) of 1976, as amended, and the National Environmental Policy Act (NEPA) of 1969, as amended: Development of the management plan is guided by the legal authority found in FLPMA and NEPA. In developing land use plans, FLPMA and NEPA require that the BLM use an interdisciplinary approach and provide opportunities for public involvement and interagency coordination. In addition, FLPMA requires land use plans to:

- give priority to the designation and protection of Areas of Critical Environmental Concern
- consider the present and potential uses of the public lands
- consider the scarcity of values involved
- rely on public lands inventories
- comply with pollution-control laws; and
- manage Wilderness Study Areas to ensure that their potential wilderness values are not impaired

Both NEPA and FLPMA require the BLM to provide the public with information about the effects of implementing land use plans.

Since the passage of FLPMA, the BLM identified certain areas, now within the Monument, for wilderness review. These areas, called Wilderness Study Areas (WSAs) and Instant Study Areas (ISAs), have been managed under the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP) (BLM Manual H-8550-1) since they were identified. The objective of the IMP is to manage those lands so as not to impair their suitability for designation as wilderness. The WSAs and ISAs within the Monument will continue to be managed under the IMP, and the Monument Management Plan will only be carried out to the extent that it does not conflict with the IMP, until action is taken by Congress. If Congress decides not to designate the WSA lands as wilderness, the lands would then be managed under the provisions of the Monument Management Plan.

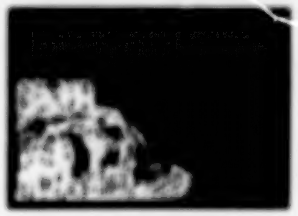
PLANNING CRITERIA

In addition to the planning considerations of the Proclamation and FLPMA, BLM planning regulations (43 CFR 1610) require preparation of planning criteria to guide development of all resource management plans. Planning criteria ensure that plans are tailored to the identified issues and ensure that unnecessary data collection and analyses are avoided. Planning criteria are based on applicable law, agency guidance, public comment, and coordination with other Federal, state and local governments, and Native American Indian tribes.

The planning criteria used in developing the Grand Staircase-Escalante National Monument Management Plan are as follows:

- The plan will be completed in compliance with FLPMA and all other applicable laws. It will meet the requirement of the Proclamation to protect the objects of geological, paleontological, archaeological, biological and historic value within the Monument. However, the full extent of the Monument's resources are not yet known.
- The Monument Planning Team will work cooperatively with the State of Utah, tribal governments, county and municipal governments, other Federal agencies, and all other interested groups, agencies and individuals.

- The Monument plan will establish the guidance upon which the BLM will rely in managing the Monument.
- The planning process will include an Environmental Impact Statement that will comply with National Environmental Policy Act standards.
- The plan will emphasize the scientific and historic resources of the Monument. It will also identify opportunities and priorities for research and education related to the resources for which the Monument was created. In addition, it will describe an approach for incorporating research into management actions.
- Due to the size of the Monument, the number of entry points, the importance of emphasizing local community involvement in visitor services, the need to assure managerial efficiencies, and the overwhelming response during scoping, the plan will assume that a single large scale office/visitor center is neither feasible nor desirable. Major facilities and services, whenever possible, will be located in nearby communities, outside the Monument boundaries, with locations based upon considerations such as the social, economic, and infrastructure factors in surrounding communities, and the need to facilitate effective management.
- The plan will set forth a framework for managing recreational activities to provide for enjoyment of visitor experiences consistent with the Proclamation.
- The plan will recognize valid existing rights within the Monument and review how valid existing rights are verified. The plan will also outline the process the Bureau of Land Management will use to address applications or notices filed after completion of the plan on existing claims or other land use authorizations.
- The management of grazing is regulated by laws and regulations other than the Proclamation. The plan will incorporate the statewide standards and guidelines recommended by the Utah Bureau of Land Management Resource Advisory Council and accepted by the Secretary of Interior. It will lay out a strategy for ensuring that proper grazing practices are followed within the Monument. In addition, the plan will outline the subsequent NEPA and decision making processes that the BLM will follow to manage grazing within the Monument.
- The plan will directly involve Native American Indian tribal governments by providing strategies for the protection of recognized traditional uses.
- The lifestyles of area residents, including the activities of grazing and hunting, will be recognized in the Monument Plan.
- The plan will not address boundary adjustments. Boundaries were established by the President and cannot be adjusted administratively.
- The plan will recognize the State's responsibility to manage wildlife, including hunting and fishing, within the Monument.
- Resolution of the State land inholding issue is a priority for the Department of the Interior and the BLM, and is being addressed separately from the management plan. Both state and private inholdings within the Monument are covered by the analysis in this document, although this draft document does not propose decisions for acquisition or management of these lands. If the BLM acquires these lands, they will be managed consistent with the plan, subject to any constraints associated with the acquisition.
- The plan will address transportation and access, and will identify where better access is warranted, where access should remain as is, and where decreased access is appropriate to protect Monument resources and manage visitation.



SIGNIFICANT DECISIONS PROPOSED IN THE PLAN

The Monument Management Plan provides a broad array of decisions concerning major resource management issues, especially in the action alternatives (Alternatives B, C, D, and E). The decisions vary among the respective alternatives, and their level of specificity also differs. As in the case of any resource management plan, it is expected that subsequent activity planning will occur, consistent with the guidance included in this plan, in order to make decisions on individual activities or classes of activities. For example, this could include the management of outfitter and guide services in a given area, or allowances for designated primitive camping. The most significant areas in which this plan offers decisions include:

- designation of open routes
- major visitor facilities
- minor visitor facilities
- cross-country vehicle travel
- Wild and Scenic River recommendations
- Areas of Critical Environmental Concern
- recreation management
- collection of objects
- air quality
- water quality
- water development
- vegetation management
- scientific research activities

There are several areas for which major decisions have been deferred. For example, livestock grazing will ultimately be addressed after the completion of assessments for each grazing allotment and the preparation of new allotment management plans. Although the Monument Management Plan will be a factor in decisions that result from such activities, along with current BLM regulations and applicable law and policy, the plan does not present such decisions. Similarly, the plan does not offer recommendations for new Wilderness Study Areas or recommendations for legislative action regarding existing Wilderness Study Areas. It was infeasible to address these resource decisions in this plan due to a variety of constraints, including the timetable mandated by the President for the plan's preparation, as well as the need for enhanced baseline data and analysis of such data. The plan also does not make specific decisions concerning valid existing rights, which may be asserted in the future under various authorities. Instead, as outlined in Chapter 2, the BLM will periodically verify the status of valid existing rights. When an action is proposed pursuant to any of them, the BLM will analyze its potential impacts to provide a basis for decision making.

WHAT'S NEXT IN THE PLANNING PROCESS

Availability of this Draft Management Plan/DEIS was announced in the Federal Register and in local media. Publication of the Notice of Availability opens a comment period for the public to submit comments on the draft. During this period, public meetings will be held in locations and at times announced in the letter accompanying this document and in local media.

After analysis and consideration of public comment on the draft, the Proposed Monument Management Plan/Final EIS is expected to be released in the summer of 1999. Opportunities to protest proposed decisions will be provided in accordance with BLM regulations and policies. The Approved Monument Management Plan is expected to be completed by September 1999.

Chapter 2

Alternatives

CHAPTER 2 - ALTERNATIVES

INTRODUCTION

Five alternative plans for the management of the Monument, including a "no action" alternative, are described in this Draft Monument Management Plan and Draft Environmental Impact Statement (DEIS).

Alternatives B, C, D, and E describe various ways the provisions of the Proclamation would be applied to direct management of the Monument. Each alternative has a somewhat different emphasis, primarily defined in terms of resource focus, but all afford the high degree of protection for Monument resources required by the Proclamation. As a result, the range of alternatives presented in this plan is narrower than in standard Bureau of Land Management (BLM) management plans. This DEIS does represent a full range of the alternatives possible within the parameters of the Proclamation.

Alternative A is the No Action Alternative. The No Action Alternative describes the continuation of the current management of the Monument, in which the provisions of the Proclamation and the Interim Guidance issued by the Director of the BLM are applied as proposals are received, and to needs as they occur. This alternative does not refer to the management that was in place prior to Monument designation, but instead assumes the continuation of the interim management, undertaken subsequent to designation and before the preparation of this management plan.

Alternative B, the Preferred Alternative, emphasizes an integrated approach by concentrating recreational uses along the highway corridors, restricting uses and access in the interior, and by conducting aggressive research and applied science programs.

Alternative C emphasizes resource protection by conducting aggressive research and applied science programs.

Alternative D emphasizes resource protection by concentrating recreational uses along the highway corridors peripheral to the Monument, while restricting uses in and access to the Monument interior.

Alternative E emphasizes resource protection by controlling uses, while separating some recreational uses to avoid conflicts between them.

Zones are used in Alternatives B, C, D, and E to display various management emphases, and are delineated by geographic area. In each case, the zones provide guidance to help define permitted activities and any stipulations pertaining to them, as well as any excluded activities. These zones are not generic across all alternatives. Instead, each of these alternatives has its own array of zones. They are, however, comparable in some respects. For example, each alternative includes zones that might be perceived as more or less restrictive. In this context, zones are tools that identify specific Monument resources on which management will focus attention, and provide guidance for future decision making. The zones are not blueprints, however, since Monument managers would have to determine whether a specific action is appropriate for the zone in which it is proposed. Zone boundaries sometimes overlap the boundaries of existing Wilderness Study Areas (WSAs), and zone criteria may appear to conflict with WSA protection. However, no action would be taken that would impair the suitability of lands under wilderness review for designation as wilderness until action is taken by Congress to either designate them or release them from further protection.

There are numerous references to "allocations" related to recreational and research uses in this plan. Allocations are limitations placed on the total numbers of people and support animals allowed to conduct a certain activity. These allocations are in addition to group size limitations. Specific activity planning will occur as necessary to provide more specific decision making associated with the implementation of this plan's allocations. It is important to note, therefore, that in this instance the use of the term "allocations" does not pertain to the management of livestock grazing.

The alternatives vary in many aspects, but they are similar in many others. Rather than repeat the similar aspects in each alternative description, the procedures and actions that are the same in all alternatives are summarized at the end of this chapter in the "Management Common to All Alternatives" section. Management which is common to all alternatives will be implemented under any alternative selected, except as noted.

RATIONALE FOR THE PREFERRED ALTERNATIVE

The process of developing the alternatives and selecting the preferred alternative required consideration of various approaches in order to implement the Proclamation, Federal Land and Policy Management Act (FLPMA), and other applicable mandates, as well as the various objectives encompassed in the planning criteria. In identifying Alternative B as the preferred alternative, the Monument Planning Team determined that this alternative: (a) most effectively accomplishes the overall objective of protecting Monument resources, (b) best addresses the diverse community and stakeholder concerns in a fair and equitable manner, and provides the most workable framework for future management of the Monument. Among the attributes of this alternative which led the planning team to this determination are:

- Establishment of a solid science program that would be used to define and protect the resources of the Monument. In Alternative B, the BLM would actively develop a science program. This program would be used to conduct and apply research to improve land management practices, and to increase understanding of science, the land, and its history. This science program emphasis is greater than in all other alternatives except Alternative C. Alternative C would provide a more exclusive focus on research, but fewer opportunities for visitor interaction and education, and would allow greater impacts to the Monument.
- Providing for visitor use in a manner consistent with the protection of Monument resources and providing opportunities for cultural, recreation and aesthetic experiences. Alternative B, like Alternatives C, D, and E, would focus visitation on the periphery of the Monument, along the existing highway corridors, and in existing recreation areas to maintain the unspoiled nature of the interior of the Monument. Overall, it is expected to provide the best balance between the need to provide access and visitor use and the need to protect Monument resources from direct and indirect impacts of visitor use. This alternative provides greater protection for Monument resources from impacts of motorized use, campgrounds, and large group use than all other alternatives except Alternative D. The preferred alternative still ranks as one of the highest in providing visitor access to a wide range of educational and aesthetic experiences.
- Directing economic development opportunities toward the communities surrounding the Monument. Alternative B is expected to be one of the most responsive to the economic development needs of the communities. Although all alternatives are expected to have only moderate impacts on the economies of nearby communities, this alternative should provide larger growth in visitation, local government revenues, and employment than all other alternatives except Alternative E. Alternative E would also allow much greater impacts to the Monument by outside visitation.

The planning team recognizes that its determination of the preferred alternative results from a qualitative judgement, and that those who are interested in the Monument's future management will have various perspectives on the issues addressed in this document. A significant purpose of this planning effort is to facilitate public dialogue on those issues.

ALTERNATIVE A
(No Action Alternative)

INTRODUCTION

Following the establishment of the Monument, adjustments in management were made to follow the directives of the Proclamation and the Interim Management Guidance issued pursuant to the Proclamation. The No Action Alternative would continue the present management approach, guided by the Proclamation, Interim Guidance, and existing law and policy. The No Action Alternative is required by the National Environmental Policy Act (NEPA) and provides the baseline against which to compare the other alternatives.

The Interim Guidance states that actions not precluded by the Proclamation and not in conflict with the established purposes of the Monument may continue. At the same time, the Interim Guidance precludes or defers actions and decisions that might conflict with the Proclamation until a management plan is in place. The No Action Alternative would continue this baseline approach. It would also continue current levels of research, maintenance, and access consistent with the Proclamation and Interim Guidance. A more detailed discussion of management under the No Action Alternative follows.

MONUMENT RESOURCES

Air Quality

The Monument would continue to be managed as a Prevention of Significant Deterioration Class II area designated by the Clean Air Act.

Water

The Monument would continue implementation of water quality monitoring in cooperation with the Utah Division of Water Quality

Vegetation

Management ignited prescribed fire would be used only to restore natural systems or to reduce hazardous fuels. Existing areas of vegetation manipulation would be maintained and new manipulation would be allowed only to protect or enhance Monument resources.

Animal Damage Control

Animal damage control activities within the Monument would be limited to the taking of individual animals responsible for verified livestock kills.

Wild and Scenic Rivers

In this alternative, a suitability determination would not be made, and protective management would continue indefinitely on all 330 miles of eligible river segments listed in Table 3.4 and shown on Map 3.7 in Chapter 3.

Protective management for river segments awaiting a suitability determination is subject to valid existing rights and to actions within the BLM's authority, and consists of a case-by-case review of proposed actions. Protective management does not provide any pre-determined outcome, only that the river values would be considered.

RESEARCH

Research would continue to be supported at current levels. Management would identify opportunities for and priorities of research, and how new information would be incorporated into management actions. Research that would result in impairment of wilderness suitability would not be allowed.

FACILITIES AND USE MANAGEMENT

The Escalante Canyons and Paria/Hackberry area would continue to be managed as special recreation management areas. Management prescriptions for these areas are outlined in Appendix 3.

Visitor site facilities, including parking area construction, interpretive sites, picnic facilities, restrooms, and trailhead construction, would be allowed only as needed for resource protection, or to address health and safety concerns. Signing for roads, trails, directions, safety, and interpretation would be provided as needed.

Camping area construction would continue in accordance with management plans for the existing developed sites. Dispersed camping would be allowed, with recommendations to camp in the 21 designated primitive campsites along interior roads such as the Burr Trail and Hole-in-the-Rock Road.

Campfires would be allowed throughout the Monument.

A group size limit of 12 people would continue to be recommended for the Escalante Canyons.

There would be no allocations, but the self-registration program in the Escalante Canyons and Fiftymile Mountain would continue.

Permits approved in 1997 for competitive and special events would continue to be approved each year. Permits for additional competitive events would not be allowed.

No new outfitter and guide permits would be issued, except for one-time, non-surface disturbing activities.

Communication sites would continue to be allowed as needed with visual impacts mitigated. Utility rights-of-way (pipelines, power lines, etc.) would be issued only for those necessary for continued existence of established communities/inholdings and that do not conflict with Monument resources. All of the Monument would remain open for this kind of construction on a case-by-case basis.

Filming permits would continue to be issued.

New water developments would be considered if they would protect or enhance Monument resources. Functioning existing water developments could be maintained, consistent with the protection of Monument resources.

TRANSPORTATION AND ACCESS

Access is generally open (1,363,477 acres), except in the Outstanding Natural Areas, Research Natural Areas, and some riparian areas (64,619 acres), which are currently closed to motorized access (Map 3.11 in Chapter 3). Some parts of the Kaiparowits and the Paria/Hackberry areas (256,802 acres) have limited access. In open and limited areas, all methods of access (including bicycle, vehicle, wheeled, foot, horse, etc.) are allowed but there is limited accessibility for some vehicles on some routes.

Trail construction would continue to be allowed. Trail maintenance would continue as needed.

CHAPTER 2 - ALTERNATIVE A

TABLE 2.1
CURRENT MANAGEMENT

ISSUE	CURRENT MANAGEMENT
Monument Resources	
Vegetation manipulation	• maintain existing or allow new only to protect or enhance Monument resources • management ignited fire used to restore natural systems or to reduce hazardous fuels
Research	
Research	• continue to support at current levels
Facilities and Use Management	
Parking area and trailhead construction	• allowed, as needed for resource protection
Signing	• continue to provide as needed
Interpretive site and picnic areas	• none identified, develop as needed
Toilets	• allowed where needed to address health and safety concerns
Camping	• continue implementing management plans for developed sites • continue dispersed camping, with recommendations to camp in designated primitive campsites along the Burr Trail and Hole-in-the-Rock Road
Campfires	• allowed
Group size	• limit of 12 people is recommended for the Escalante Canyons
Allocation	• no allocation • continue self-registration permit program in the Escalante Canyons and Fiftymile Mountain
Competitive and special events	• Permits approved in 1997 for competitive events would continue to be approved each year. • Permits for additional competitive events would not be allowed.

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ISSUE	CURRENT MANAGEMENT
Outfitter/guide	• no new permits, except for one-time, non-surface disturbing
Communication site and utility rights-of-way (pipelines, power lines, etc.)	• communication sites allowed as needed with visual impacts mitigated • issue only those necessary for continued existence of established communities/inholdings and that do not impact Monument resources
Filming	• allowed by permit
Transportation and Access	
Access	• access is generally open • 2,176 miles of routes open • Outstanding Natural Areas, Research Natural Areas, and some riparian areas would continue to be closed to motorized access • all methods currently allowed, including mountain biking, limited accessibility
Trail construction	• allowed
Trail maintenance	• continue as needed

ALTERNATIVE B (PREFERRED ALTERNATIVE)

INTRODUCTION

This alternative would emphasize preservation of the Monument as an unspoiled natural area, while recognizing its value as a scientific resource for a variety of research activities. The frontier character of the land would be maintained both as a safeguard for Monument resources and as an inspiration to its visitors. Visitor services would be located primarily in the communities outside the Monument, which would help to provide economic opportunities for the communities and provide protection for Monument resources.

The preferred alternative includes a strong BLM-directed science program, focused on better understanding and preserving the resources of the Monument while assisting in the development of improved land management practices. Recreational use of the Monument would be managed in part by the level of facilities provided, by restrictions on access, and by group size limits. This would be guided by a zoning system designed to maintain the undeveloped nature of Monument lands.

By protecting the undeveloped and unspoiled nature of the Monument, while minimizing further intrusions, the visitor experience would be enhanced and scientific opportunities would be preserved for future generations. The science program itself would include a public education program to increase public understanding of science, the land, and its history. It would emphasize continued collaboration, and employ a Science Advisory Council to advise on the interaction of science, research, and management.

This alternative uses four zones to illustrate where different management strategies would be employed (Map 2.1). More detailed management descriptions follow the zone descriptions.

Frontcountry (113,737 acres - 7 percent cf the Monument)

This zone would be the focal point for visitation, concentrating use along Highways 12 and 89, and the Burr Trail. Numerous interpretive sites, trails, and overlooks would be provided, which would feature a range of Monument resources and a variety of day-use opportunities for visitors.

Passage (38,137 acres - 2 percent of the Monument)

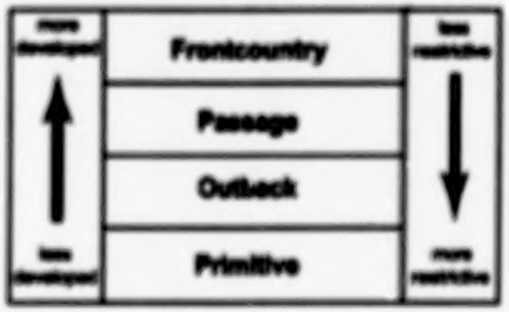
This zone includes secondary travel routes where visitor use would not be directed or encouraged, but would be accommodated. Rudimentary facilities, such as toilets, signs, designated primitive campsites, and trailheads, would be provided where needed for resource protection or public safety.

Outback (582,237 acres - 30 percent of the Monument)

This zone would provide an undeveloped, primitive, and self-directed visitor experience, including provisions for motorized and mechanized access on designated routes. Facilities of any kind would be rare, provided only where essential for resource protection. Limits on visitor numbers could be used to keep use at low levels. Dispersed campsites could be designated.

Primitive (1,038,798 acres - 61 percent of the Monument)

This zone would provide an undeveloped, primitive, and self-directed visitor experience, without provisions for motorized or mechanized access. Travel could be on foot, horse, or with pack animals. Facilities would be virtually nonexistent. Limits on visitor numbers could be used to maintain use at low levels. Management activities which enhance the primitive character of this zone, and research projects to develop such management activities, would be encouraged in this zone.



MONUMENT RESOURCES

Air Quality

The Monument would continue to be managed as a Prevention of Significant Deterioration Class II area designated by the Clean Air Act.

Water

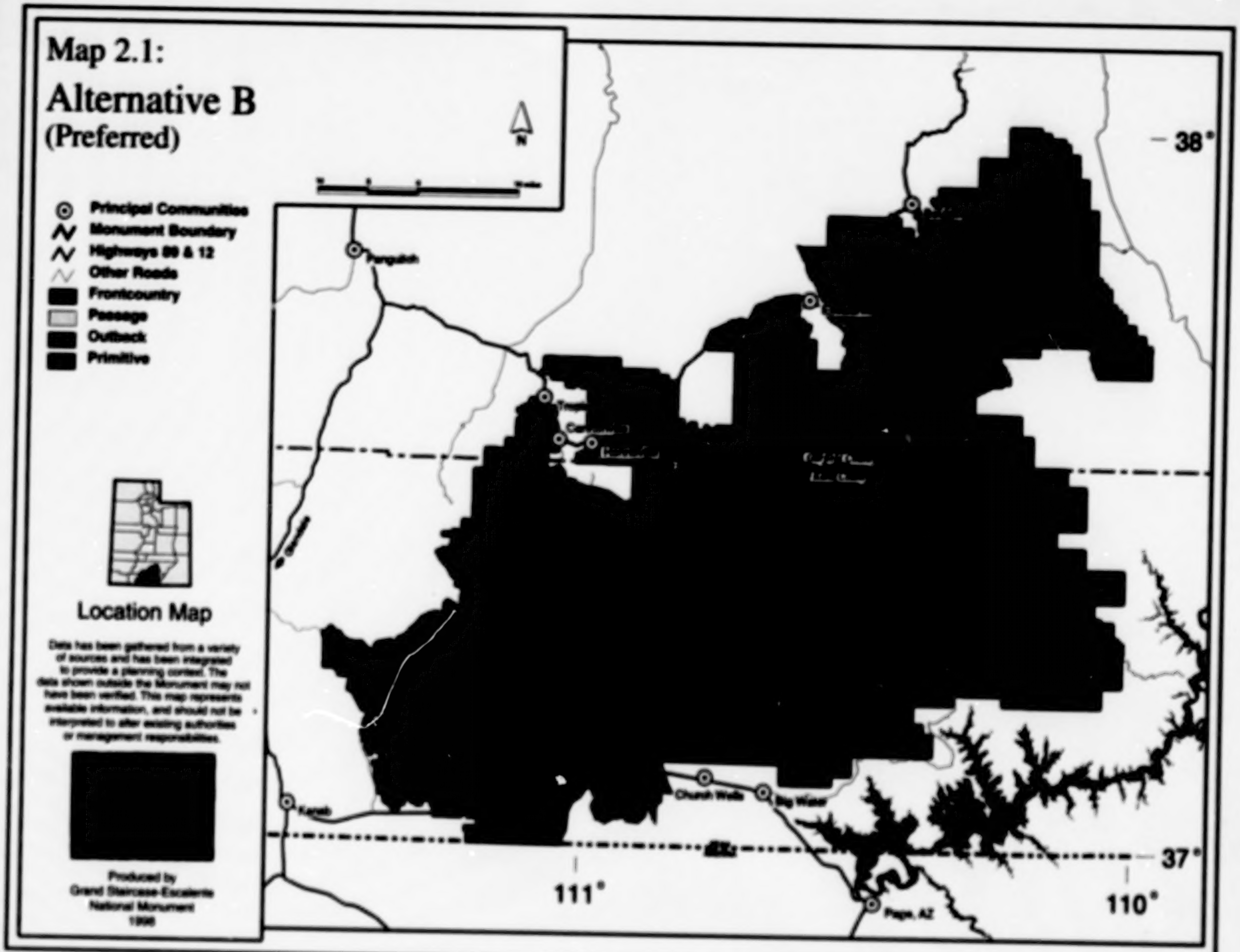
The BLM would request that the State of Utah accelerate development of total maximum daily load for 303d waters within the Monument.

Water quality monitoring would be implemented when ground disturbance or other factors could adversely affect water quality. Mitigation would be required if adverse effects were detected.

Vegetation

Vegetation manipulation, including mechanical, chemical, biological, hand cutting (including with hand-held power tools), and management ignited fire, could be used as management tools throughout the Monument to restore natural systems and to protect sensitive resources. Mechanical methods could not be used in the Primitive Zone.

Map 2.1:
Alternative B
(Preferred)



Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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Animal Damage Control

Animal damage control activities within the Monument would be limited to the taking of individual animals responsible for verified livestock kills, where reasonable livestock management measures to prevent predation had been taken and had failed. Reasonable livestock management measures could include experimental measures in order to develop improved land management practices. A long-term scientific monitoring program would be required to determine the effectiveness of all animal damage control measures.

Wild and Scenic Rivers

In this alternative, 17 of the 25 eligible river segments (252 miles) (see Table 3.4 in Chapter 3 and Appendix 4) would be determined suitable and would be recommended for Congressional designation into the National Wild and Scenic River System. The eight eligible river segments not found suitable would be: Dry Hollow Creek, Cottonwood Canyon, Lower Horse Canyon, Wolverine Creek, Little Death Hollow, Phipps Wash, unnamed tributary west of Calf Creek, and parts of Harris Wash and side canyons into The Gulch. The suitable segments are shown on Map 2.2. A rationale for their suitability determinations are found in Appendix 5.

The BLM would manage suitable segments for the preservation of outstandingly remarkable values, under the prescriptions and directions of the Monument Management Plan. River segments determined unsuitable would be managed under the direction and prescriptions of the Monument Management Plan.

The tentative classifications in this document were chosen to be consistent with the zones in each alternative.

RESEARCH

The natural, physical, and social sciences, including the study of history, would be essential parts of the science program.

A science advisory group would be chartered (under the Federal Advisory Committee Act) to advise on the Monument research program and its integration with Monument management.

Surface disturbing research, such as archeological and paleontological excavations, would generally be allowed, with appropriate mitigation, in all but the Primitive Zone. In the Primitive Zone, surface disturbing research would only be allowed in cases of unique opportunities with extremely high scientific value. Permits would be required for all research within the Monument.

A Monument website, Monument-sponsored science publications, and field schools would be part of the science program.

To carry out the Monument science program, four science strategies would be applied, by zone, within the Monument. These strategies are as follows:

- Throughout the Frontcountry and Passage Zones, and in the Escalante Canyons and the Paria/Hackberry areas, substantial public use puts Monument resources at high risk. In these areas, the BLM would, as a priority, direct an intensive inventory, monitoring, and mitigation program in order to detect and protect Monument resources. High priority would also be placed on the collection of oral histories related to the Monument area.
- Throughout the Outback Zone, and in four riparian corridors (the Gulch, upper Wahweap Creek, upper Last Chance Creek, and a segment of Cottonwood Creek), previous land disturbance or significant land use has occurred. These areas now offer opportunities to conduct research related to the improvement of land

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management practices, and to the study of land disturbance and resilience. The BLM would conduct and support such research in these areas.

- Throughout the Primitive Zone, large areas of relative undisturbed land offer opportunities for ecosystem level research, including research which crosses Monument boundaries to involve contiguous lands. This zone also offers opportunities for research related to the thousands of years of human presence within it, and to the effects of that presence on both the land and people. The BLM would permit and support such research in this area.
- An inventory, monitoring, and mitigation program would be carried out Monument-wide, but this work would be carried out first in the areas most at risk, specifically in the Frontcountry and Passage Zones, and the Escalante Canyons and Paria/Hackberry areas. The second priority for completing inventory, monitoring, and mitigation would be the Outback Zone, followed by the Primitive Zone. Exceptions could be made where necessary for resource protection, such as when new, significant resources were discovered, or when significant resources were determined to be at risk.

FACILITIES AND USE MANAGEMENT

The Escalante Canyons and the Paria/Hackberry area, both within the Primitive Zone, would continue to be managed as special recreation management areas. Management prescriptions for these areas are outlined in Appendix 3.

In this alternative, visitor services would be primarily located in the communities outside the Monument; no major facilities or services would be located within the Monument. In addition, visitation would be focused on the periphery of the Monument, along the existing highway corridors convenient to the communities, while access would be limited in the Monument interior. Monument resources would be protected, while providing economic opportunities to the communities surrounding the Monument.

As in all alternatives, visitor centers and Monument administrative facilities would be located outside the Monument, in the nearby communities. Within the Monument, visitor facilities would vary by zone, but in all zones, facilities generally would be limited.

In the Frontcountry Zone, visitor day-use facilities and signs would be encouraged as necessary and adequate for visitor use, safety, and for the protection of sensitive resources. These facilities could include pullouts, parking areas, trailheads, toilets, fences, and picnic areas. Interpretive sites and signs would be common. In the Outback and Passage Zones, limited facilities and signs, for resource protection or visitor safety, would be allowed. Construction of facilities would not be allowed in the Primitive Zone, and signs would be provided only for resource protection purposes.

No new developed camping facilities would be provided in the Monument. However, designated primitive campsites for individuals would be established along the Burr Trail, and primitive campsites for individuals and for groups would be designated along Hole-in-the-Rock Road. Primitive campsites for individuals or groups would be designated, where necessary for resource protection, in the Outback and Primitive Zones. Dispersed camping would not be allowed within ½ mile of designated primitive campsites. Dispersed camping would not be allowed anywhere in the Frontcountry Zone, but would be allowed in all other zones except as noted above.

Campfires would not be allowed in the Escalante and Paria/Hackberry canyons, No Mans Mesa, and other relict plant areas. Fires would be allowed only in designated fire grates or in fire pans in the Frontcountry and Passage Zones, and wood collection for

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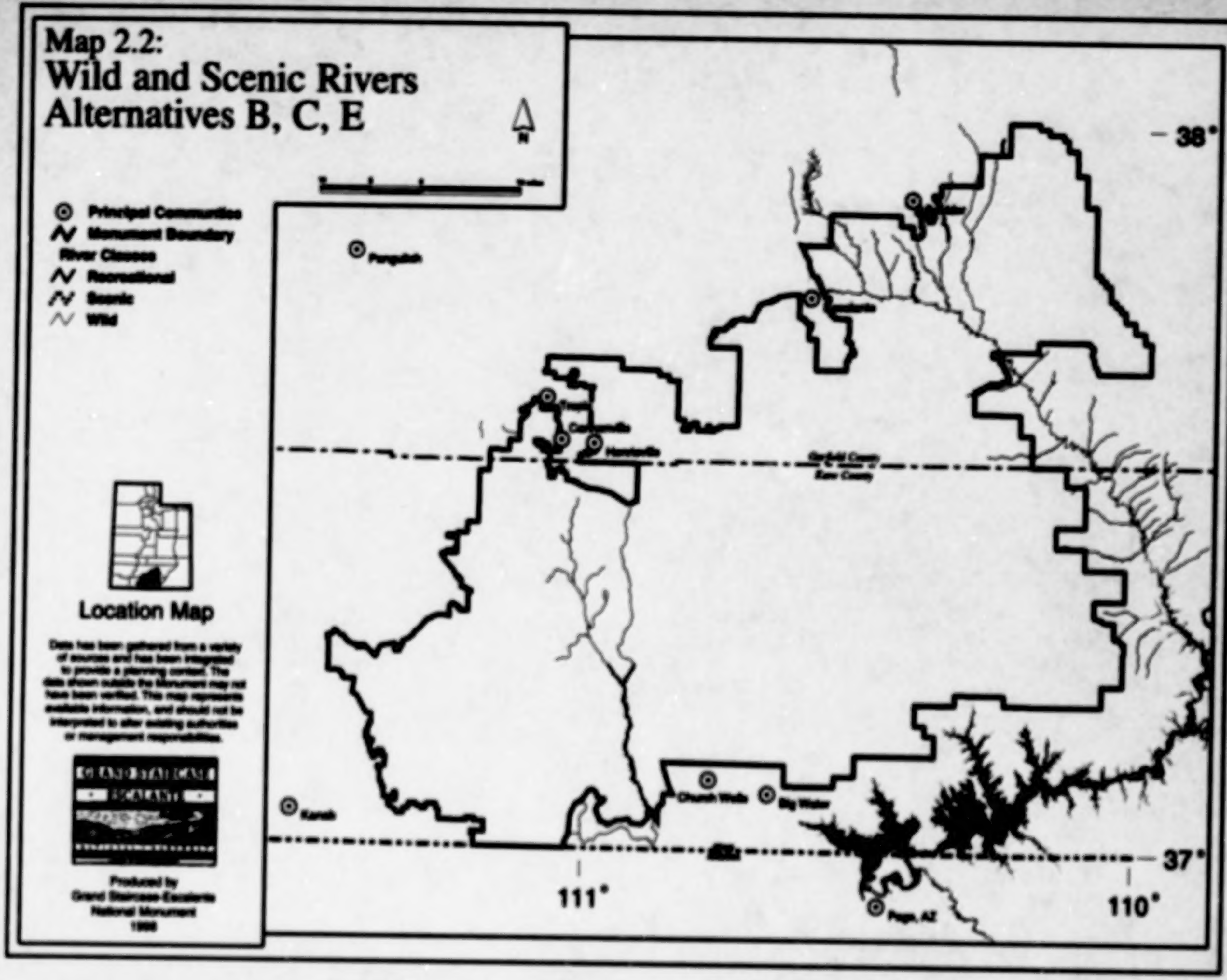
Map 2.2: Wild and Scenic Rivers Alternatives B, C, E



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campfires would not be permitted. In the Outback and Primitive Zones, fire pans would be encouraged. Dead and down wood could be collected for campfires in some parts of the Outback and Primitive Zones.

Permits could be required for overnight use, or for specific uses throughout the Monument. Permits for groups of 25 or more people and/or animals would be required in the Frontcountry and Passage Zones, for use beyond pullouts and parking areas. Group size would be limited to 12 people and/or animals in the Primitive and Outback Zones.

It is likely that it would become necessary to place limits on the numbers of people and/or animals allowed in the Primitive Zone, in order to protect Monument resources. It is also possible that limits would become necessary in both the Passage and the Outback Zones. Use limits are unlikely to be implemented in the Frontcountry Zone.

Competitive and special events would be prohibited in all zones.

Outfitter and guide operations would be allowed throughout the Monument in compliance with the constraints of the zone and allocation and use limits set by the BLM.

In the Frontcountry and Passage Zones, communication sites and utility rights-of-way would be allowed, but would have to blend with the landscape. In the Outback Zone, communication sites and utility rights-of-way would be allowed within the constraints of the zone and where no other reasonable location exists. In the Primitive Zone, aerial and buried lines would not be permitted, but communication sites would be allowed where no other reasonable location exists. Any facilities would have to blend with the landscape.

Minimum impact filming would be allowed in the Frontcountry, Passage, and Outback Zones. Filming would not be allowed in the Primitive Zone.

Water developments could be used as a management tool throughout the Monument to protect Monument resources or to restore natural systems, subject to project level NEPA analysis.

TRANSPORTATION AND ACCESS

Cross-country travel would be prohibited in this alternative. All routes would be closed to motorized and mechanized vehicle use unless designated open. Vehicles would be allowed to operate only on routes designated open. This approach would be consistent with that of the State of Utah, the United States Forest Service, and other land managers in the area.

Street legal motorized vehicles, including four-wheel-drives and mechanized vehicles (including mountain bicycles), would be allowed on 818 miles of routes designated open in the Frontcountry, Passage, and Outback Zones (Map 2.3). No routes would be designated open in the Primitive Zone.

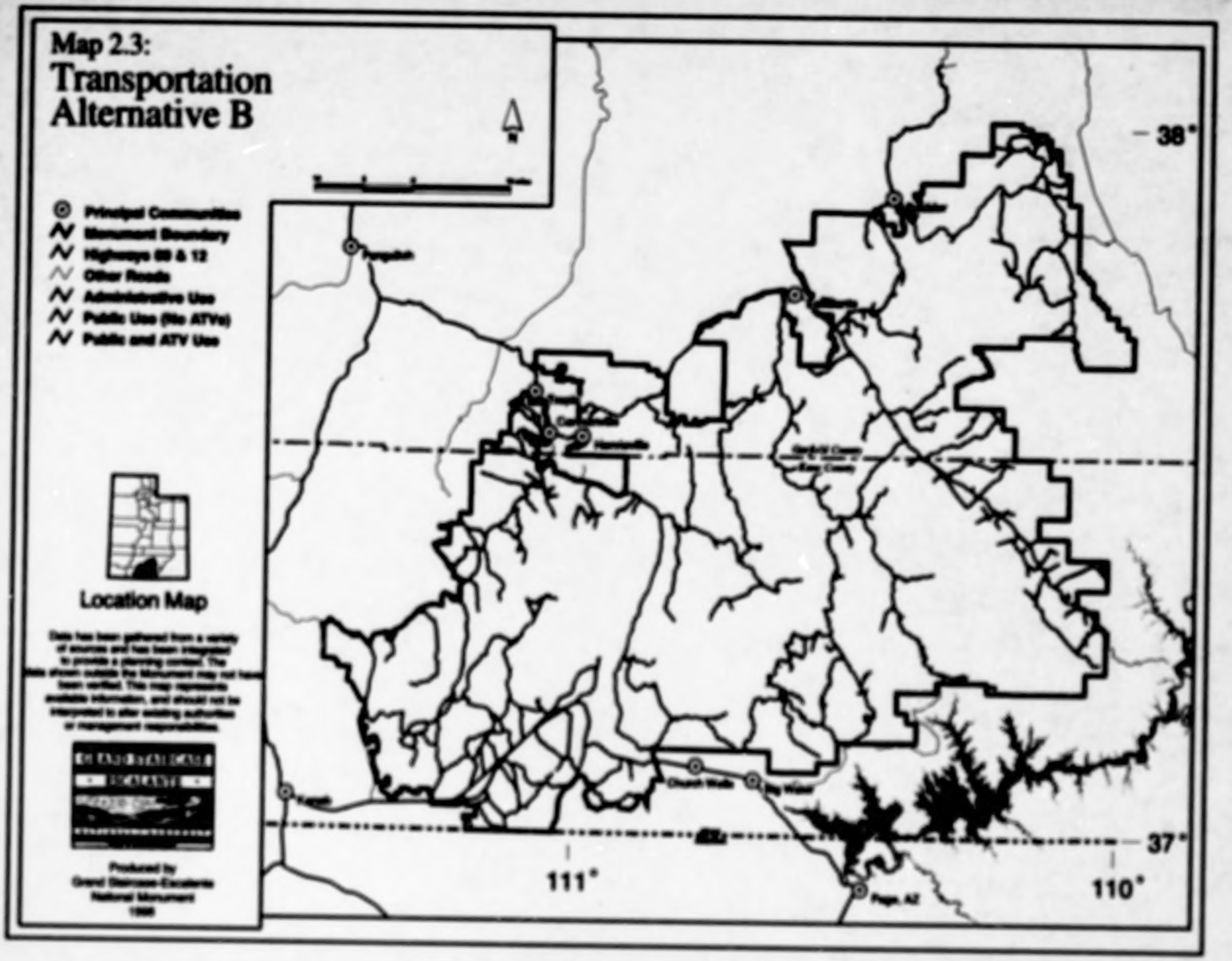
Non-street legal all-terrain vehicles (ATVs) and dirt bikes would be restricted to those routes designated as open for their use. Non-street legal ATVs and dirt bikes would be allowed on 591 miles of the 818 miles of routes designated open to street legal vehicles in the Frontcountry, Passage, and Outback Zones; no routes would be designated open to them in the Primitive Zone. The BLM, and Kane and Garfield Counties, would meet periodically to evaluate the routes designated as open for ATV use. All zones would allow hikers, horses, and pack animals. No domestic animals, including saddle and pack animals, would be allowed on No Mans Mesa.

Authorized users and permit holders would be allowed motorized access not allowed to the general public. Authorized users could include grazing permittees, researchers, and others carrying out authorized activities under a permit or other authorization. Routes designated open for certain administrative purposes (229 miles) are shown on Map 2.3. These routes would be gated and locked. Access would be strictly limited to a specific time period and number of trips, and would only be granted for legitimate and specific purposes. Maintenance would be the minimum required to serve the administrative purpose. If the administrative purpose were to cease, the route would be closed.

With the exception of those segments listed below, open routes could be maintained within the current disturbed areas; no widening, new pullouts, passing lanes, or other travel surface upgrades could occur. Deviations from the current maintenance levels would be allowed as follows (subject to Wilderness Study Area Interim Management Policy, BLM Manual H-3550-1):

- Hole-in-the-Rock Road: Allow stabilization of washout-prone areas, primarily along the southeastern end, to prevent erosion and sediment loading in drainages.
- Smoky Mountain Road: Allow stabilization in the Alvey Wash section to prevent erosion and sediment loading in drainages.
- Cottonwood Wash Road: Allow stabilization of washout prone areas, primarily along the southern section, to prevent erosion and sediment loading in drainages.
- Skutumpah Road: Allow new crossing for safety at Bull Valley Gorge, and stabilization of washout prone areas, primarily along the northern section, to prevent erosion and sediment loading in drainages.

In the Frontcountry Zone, a full range of trails could be developed and maintained in order to provide opportunities for visitors. In the Passage Zone, trails could be developed and maintained where needed for protection of Monument resources or for public safety. Elsewhere, trails could only be developed or maintained where necessary to protect Monument resources.



Map 2.3: Transportation Alternative B

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TABLE 2.2
ALTERNATIVE B MANAGEMENT ZONES

	FRONTCOUNTRY (113,737 Acres - 7%)	PASSAGE (30,137 Acres - 2%)	OUTBACK (502,237 Acres - 30%)	PRIMITIVE (1,038,788 Acres - 61%)
Monument Resources				
Vegetation manipulation	• the following could be used as management tools to restore functioning natural systems and to protect sensitive resources: -mechanical -chemical -biological -hand cutting -management ignited fire	• the following could be used as management tools to restore functioning natural systems and to protect sensitive resources: -mechanical -chemical -biological -hand cutting -management ignited fire	• the following could be used as management tools to restore functioning natural systems and to protect sensitive resources: -mechanical -chemical -biological -hand cutting -management ignited fire	• the following could be used as management tools to restore functioning natural systems and to protect sensitive resources: -chemical -biological -hand cutting -management ignited fire • mechanical methods prohibited
Research				
Non-surface disturbing research	• allowed and encouraged • highest priority for completion of inventory, monitoring, and mitigation program • permits required	• allowed and encouraged • highest priority for completion of inventory, monitoring, and mitigation program • permits required	• allowed and encouraged • second priority for completion of inventory, monitoring, and mitigation program • conduct or support research related to improvement of land management practices, disturbance ecology • permits required	• allowed and encouraged • third priority for completion of inventory, monitoring, and mitigation program • conduct or support ecosystem level research • permits required

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	FRONTCOUNTRY (113,737 Acres - 7%)	PASSAGE (30,137 Acres - 2%)	OUTBACK (502,237 Acres - 30%)	PRIMITIVE (1,038,788 Acres - 61%)
Surface disturbing research	• allowed where necessary, with mitigation • permits required	• allowed where necessary, with mitigation • permits required	• allowed where necessary, with mitigation • permits required	• allowed only in cases of unique opportunity with extremely high scientific value, with mitigation • permits required
Facilities and Use Management				
Parking area and trailhead construction	• allowed for visitor needs • allowed to protect sensitive resources or for public safety	• allowed only to protect sensitive resources or for public safety	• allowed only to protect sensitive resources or for public safety	• not allowed
Signing	• high level of directional, safety, and interpretive signs allowed	• moderate level of directional, safety, and interpretive signs allowed	• allow only minimal directional signs at trail intersections • allow only minimal information signs • provide strong safety messages at beginning of roads	• allowed only for protection of resources
Interpretive site and picnic areas	• provide numerous interpretive sites to highlight geology, paleontology, biology, archaeology, and history • picnic areas as needed	• provide interpretive sites only for the protection of sensitive resources • picnic areas not allowed	• interpretive sites not allowed, except where necessary for resource protection • picnic areas not allowed	• no interpretive sites or picnic areas allowed
Toilets	• provide adequate sanitation facilities	• provide adequate sanitation facilities	• generally not provided, provide only where essential for resource protection	• none allowed

	FRONTCOUNTRY (113,737 Acres - 7%)	PASSAGE (30,137 Acres - 2%)	OUTBACK (502,237 Acres - 30%)	PRIMITIVE (1,030,780 Acres - 61%)
Camping	• dispersed camping not allowed • designate primitive campsites along Burr Trail	• dispersed camping allowed, except near designated primitive campsites • could designate minimal primitive campsites to protect Monument resources	• dispersed camping allowed, except near designated primitive campsites • could designate minimal primitive campsites to protect Monument resources	• dispersed camping allowed, except near designated primitive campsites • primitive campsites designated rarely, to protect Monument resources
Campfires	• campfires in designated fire grate or mandatory fire pan • no wood collection	• campfires in designated fire grate or mandatory fire pans • no wood collection	• campfires not restricted, but encourage fire pans • collection of dead and down wood only; may be prohibited in some areas	• campfires prohibited in Escalante Canyons, Paria/Hackberry area, and No Mans Mesa, relict plant areas • campfires not restricted elsewhere, but encourage fire pans • collection of dead and down wood only; may be prohibited in some areas
Group size	• groups of 25 or more people and/or animals need a special recreation permit, if going off paved parking areas and interpretive pullouts	• groups of 25 or more people and/or animals need a special recreation permit	• group limit of 12 people and/or animals	• group limit of 12 people and/or animals
Allocation	• no allocation	• allocation possible for the protection of sensitive resources or visitor experience	• allocation moderately likely for the protection of sensitive resources	• allocation highly likely for the protection of sensitive resources

	FRONTCOUNTRY (113,737 Acres - 7%)	PASSAGE (30,137 Acres - 2%)	OUTBACK (502,237 Acres - 30%)	PRIMITIVE (1,038,788 Acres - 61%)
Competitive and special events	• not allowed	• not allowed	• not allowed	• not allowed
Outfitters/guides	• allowed if outfitter/guide activities are appropriate to this zone and within allocations	• allowed if outfitter/guide activities are appropriate to this zone and within allocations	• allowed if outfitter/guide activities area appropriate to this zone and within allocations	• allowed if outfitter/guide activities area appropriate to this zone and within allocations
Communication sites and utility rights-of-way (pipelines, power lines, etc.)	• communication sites, aerial and buried lines allowed, but must blend in with the landscape	• communication sites, aerial and buried lines allowed, but must blend in with the landscape	• allow communication sites, aerial and buried lines -within the other constraints of this zone -where no reasonable alternative exists -must blend in with the landscape	• allow communication sites -within the other constraints of this zone -where no reasonable alternative exists -must blend in with the landscape • aerial and buried lines not permitted
Filming	• minimum impact only	• minimum impact only	• minimum impact only	• not allowed

	FRONTCOUNTRY **(113,737 Acres - 7%)**	**PASSAGE** **(30,137 Acres - 2%)**	**OUTBACK** **(502,237 Acres - 30%)**	**PRIMITIVE** **(1,030,788 Acres - 61%)**
		Transportation and Access		
Access	• 175 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 55 miles of the 175 miles designated routes open for street legal would be open to non-street legal ATVs and dirt bikes • some routes closed and rehabilitated • allow hikers, horses, and pack animals	• 211 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 124 miles of the 211 miles of designated routes open for street legal would be open for non-street legal ATVs and dirt bikes • allow hikers, horses, and pack animals	• 432 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 412 miles of the designated routes open for street legal would be open for non-street legal ATVs and dirt bikes • some routes closed or turned into trails • some routes closed and rehabilitated • allow hikers, horses, and pack animals	• motorized or mechanized vehicles, including mountain bicycles, prohibited • non-street legal ATVs and dirt bikes prohibited • some routes closed and rehabilitated • allow hikers, horses, and pack animals • no domestic animals, including saddle and pack animals, allowed on No Mans Mesa
Trail construction	• develop all levels of trails including fully accessible paved interpretive trails • focus on day-use opportunities	• develop trails to protect sensitive resources and for public safety	• trail development allowed only where necessary to protect resources	• trail development allowed only where necessary to protect resources
Trail maintenance	• as needed	• as needed to protect sensitive resources	• allowed only to protect sensitive resources	• allowed only to protect sensitive resources

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ALTERNATIVE C

INTRODUCTION

This alternative would emphasize the exemplary opportunities the Monument presents for scientific research in a wide variety of disciplines. The BLM would aggressively protect the scientific values within the Monument while maximizing research opportunities for the biological, geological, paleontological, archeological, and historic treasures for which the Monument was established. Consistent with all aspects of the Proclamation and the planning criteria, this alternative would emphasize two of the planning criteria: (1) identifying opportunities and priorities for research and education related to the resources for which the Monument was created, and (2) developing an approach for incorporating research into management actions.

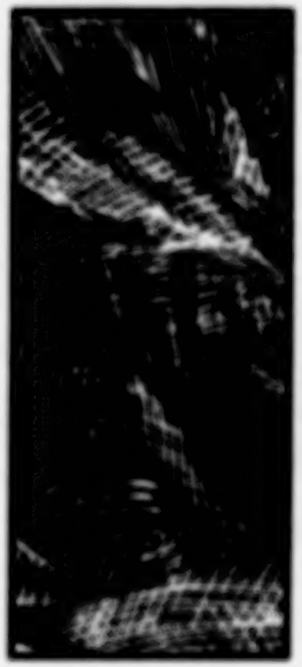
Scientific research opportunities would be given priority over other uses, and would be managed across a range of research zones. These zones would allow varying degrees of intrusive and non-intrusive research activities, while leaving certain areas undisturbed for future study. While these zones would offer a range of recreational opportunities for visitors, recreational use of the Monument would be secondary to research use. Visitor management would be directly tied to the interpretation of Monument resources and ongoing research. When feasible, visitors would be directed to sites where research was actively occurring, and directed away from sites where human impacts could adversely affect existing science projects, future research, or Monument resources. Access and surface-disturbing activities would be limited in areas where research potential or Monument resources could be compromised.

In this alternative, research proposals would be required to have a public interpretation and education component. Educators and students would have the opportunity to participate in the Monument science program, and observe or take part in research projects where it would not interfere with research objectives. The Monument would play a role in developing programs for grades Kindergarten through 12, emphasizing the area's scientific and cultural values.

Scientific interpretation would be emphasized at research sites and visitor centers. Results of scientific research and inventory data would be disseminated through interpretive displays, publications, forums, and public exhibition of objects and artifacts.

Communities around the Monument would be expected to realize economic benefits related to supporting an emerging national showcase of scientific exploration, cooperation, and management.

In this alternative, four zones highlight different opportunities for accommodating scientific exploration. More detailed management descriptions follow the zone descriptions (Map 2.4).



Intensive (151,029 acres - 9 percent of the Monument)

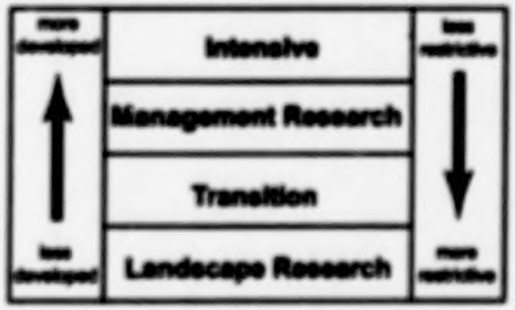
This zone includes relatively small areas that have a high degree of past, current, and expected future heavy use which presents immediate threats to resources. This zone corresponds to the principal routes and the most popular recreational sites. In these areas the BLM would aggressively carry out inventory, monitoring, and mitigation for the protection of scientific values. A primary objective would be to document, collect, and preserve scientific information. Visitor use would be intensively managed in this zone.

Management Research (350,992 acres - 21 percent of the Monument)

This zone includes some areas of ground disturbance from past land management practices. Research on the effects of past and current land management practices, on disturbance and resilience of biophysical systems, and on restorative management techniques would be conducted in this zone. This zone would be managed to accommodate research that requires some degree of ground disturbance and/or the use of motorized equipment.

Transition (230,526 acres - 14 percent of the Monument)

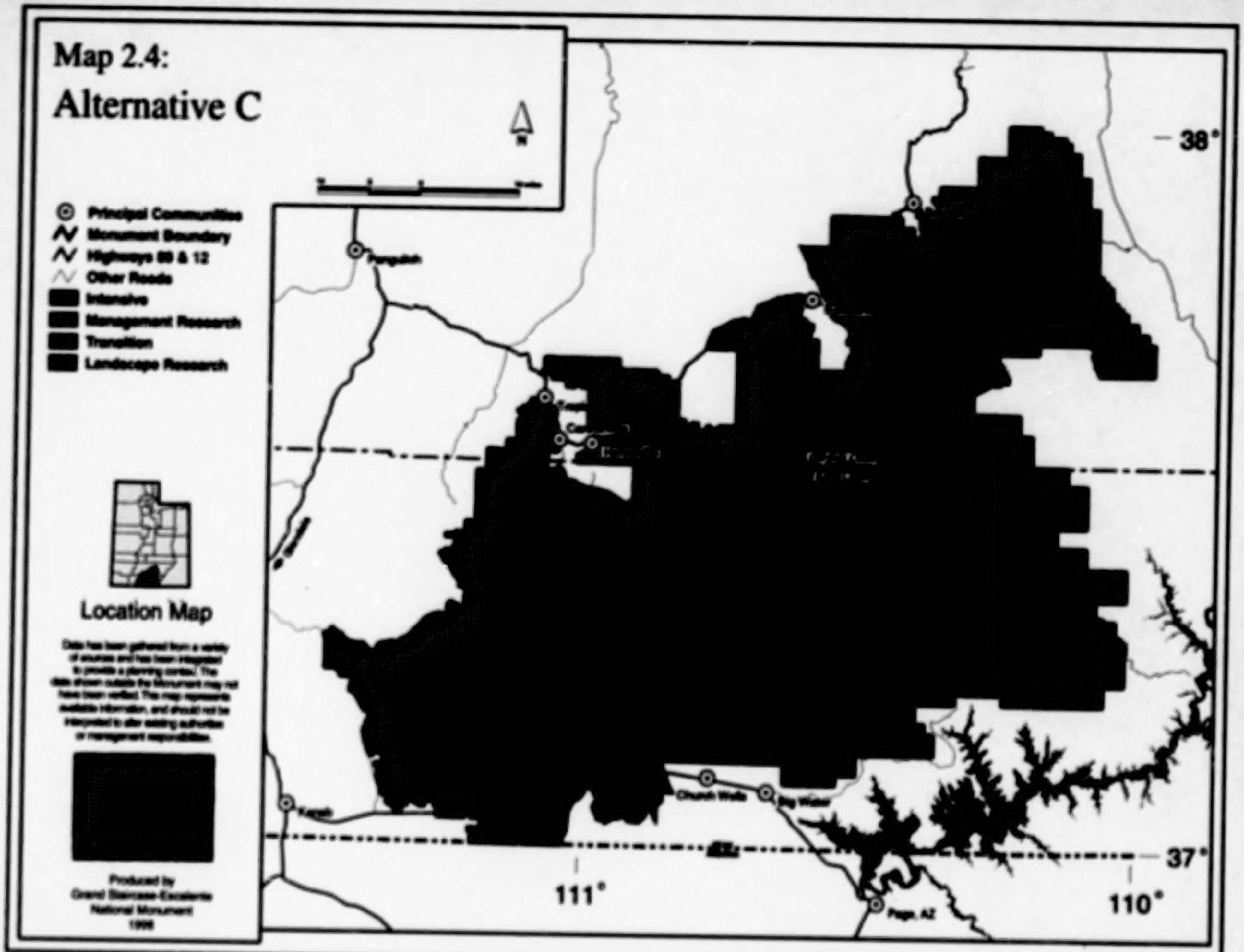
This zone has little evidence of past ground disturbing activities. It has relatively good access, but is currently receiving low visitor use, which tends to protect its scientific values. The management emphasis here would be to keep visitor use low and to conduct inventory, monitoring, and mitigation work, once it has been completed in more threatened areas. Areas within this zone could be converted to other zones if inventory and monitoring data or visitor use patterns make another zone more appropriate.



Landscape Research (952,352 acres - 56 percent of the Monument)

Generally, this zone encompasses large and relatively undisturbed lands where Monument resources would be protected by remoteness and limited access. This zone has the lowest amount of past and current use and disturbance. The zone was designed to connect the Monument with adjacent United States Forest Service, National Park Service, state, and other BLM lands. This would help to preserve natural system functions across this larger geographic area. The remote character of the zone would be maintained, and would preclude some research activities that require motorized access or use of machinery. Exceptions could be made for proposals which address unique research opportunities with high scientific values. Management actions in this zone would include enhancing the remote character by limiting access and restoring disturbed areas.

Map 2.4: Alternative C



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MONUMENT RESOURCES

Air Quality

The Monument would continue to be managed as a Prevention of Significant Deterioration Class II area as designated by the Clean Air Act.

Water

The BLM would request that the State of Utah accelerate development of total maximum daily load (TMDL) for 303d waters within the Monument, and if requested, would work with the Utah Department of Environmental Quality in conducting the TMDL analyses.

Vegetation

Vegetative manipulation, including mechanical, chemical, biological, hand cutting, and management ignited fire, would be allowed in the Intensive and Management Research Zones. No treatments would be allowed in the Transition Zone. Any non-mechanical and non-motorized treatments could be used in the Landscape Research Zone.

Animal Damage Control

Animal damage control activities within the Monument would be limited to the taking of individual animals responsible for verified livestock kills, where reasonable livestock management measures to prevent predation had been taken and had failed. Reasonable livestock management measures could include experimental measures in order to develop improved land management practices, an objective of this alternative. A long-term scientific monitoring program would be required to determine the effectiveness of all animal damage control measures.

Wild and Scenic Rivers

In this alternative, all 25 eligible river segments (330 miles) (Appendix 4)would be determined unsuitable and would not be recommended for Congressional designation into the National Wild and Scenic River System. These segments are shown on Map 3.7 and in Table 3.4 of Chapter 3.

These segments would not be managed to retain outstandingly remarkable values, but would be managed in accordance with prescriptions for this alternative.

RESEARCH

Research and resource inventory and monitoring would take priority over other human uses. Recreation and other uses would be accommodated to the extent they do not conflict with research.

The Monument would be managed to provide a wide array of opportunities for the scientific community to conduct research related to either the natural or social sciences. All research would meet Monument data collection standards to be established by a science advisory group. Additionally, research would have a multi-scale and interdisciplinary approach, when possible.

The first priority for conducting research would be to study, collect, or record scientific information that is most at risk of being damaged or lost through disturbance or the passage of time. The second priority would be to continue gathering baseline resource data on the biological, physical, cultural, and social sciences within the Monument. A third priority would be to conduct applied research into the management of natural systems, including disturbance and recovery strategies. The Monument would be a laboratory for developing innovative methods for land management, including restoration and rehabilitation.

Non-surface disturbing research would be encouraged in all zones. Surface disturbing research would be allowed for scientific purposes in the Intensive Zone, allowed to a lesser degree in the Management Research Zone, and generally not allowed in the Transition and Landscape Research Zones. Exceptions could be made in those zones for unique research opportunities.

FACILITIES AND USE MANAGEMENT

No new special recreation management areas would be proposed under this alternative. The existing special recreation management areas (Escalante Canyons and Paria/Hackberry) would not be continued (Appendix 3).

As in all alternatives, visitor centers and Monument administrative facilities would be located outside the Monument, in the nearby communities.

Visitor day-use facilities and signs would be installed where necessary for visitor use, safety, and for the protection of sensitive resources. These facilities could include pullouts, parking areas, trailheads, toilets, interpretive sites, and picnic areas. Such facilities would be allowed in the Intensive and Management Research Zones. These facilities would not be allowed in the Transition and Landscape Research Zones.

Directional and informational signs would be allowed in the Transition Zone. Signs would only be allowed in the Landscape Research Zone where required for resource protection. Existing toilets would be maintained in the Transition Zone. Temporary sanitation facilities could be allowed in the Landscape Research Zone to accommodate research and education activities.

Dispersed camping would be allowed in all zones. Camping areas would be designated in the Escalante Canyons and the Paria/Hackberry area.

Campfires would continue to be allowed in the Intensive, Management Research, and Transition Zones. Campfires would not be allowed in the Landscape Research Zone, and in the Escalante Canyons and Paria/Hackberry area.

The group size limit in the Intensive, Management Research, and Transition Zones would be 50 people and/or animals. Groups would be limited to no more than 12 people and/or animals in the Landscape Research Zone, as well as in the Escalante Canyons and the Paria/Hackberry area.

Visitation would be closely monitored and permits would be mandatory. Allocations could be utilized to protect Monument resources within the Intensive and Management Research Zones. As a tool to collect visitation information and to monitor levels of activity, overnight permits would be mandatory for the Transition Zone. Also, visitation to sensitive areas or areas of high scientific interest would be controlled by mandatory backcountry permits in the Landscape Research Zone.

Competitive and special events could be permitted within the Intensive and Management Research Zones. These events would not be allowed in the Transition and Landscape Research Zones.

Outfitter and guide services could be permitted, as appropriate to the zone, in the Intensive, Management Research, and Landscape Research Zones. These services would not be permitted in the Transition zone.

The placement of communication sites and other rights-of-way would be considered on a case-by-case basis in the Intensive and Management Research Zones. These facilities would not be allowed in the Transition and Landscape Research Zones.

Filming would not be allowed in this alternative.

Water developments could be used as a Management tool throughout the Monument to protect Monument resources or to restore natural systems, subject to project level NEPA analysis.

TRANSPORTATION AND ACCESS

Cross-country travel would be prohibited in this alternative. All routes would be closed to motorized or mechanized vehicle use unless designated open. This approach would be consistent with that of the State of Utah, the United States Forest Service, and other land managers in the area.

Street legal motorized vehicles, including four-wheel-drive and mechanized vehicles (including mountain bicycles), would be allowed on 1,187 miles of routes designated open in the Intensive, Management Research, and Transition Zones (Map 2.5). The only routes in the Landscape Research Zone are along the boundary of the zone. Non-street-legal ATVs and dirt bikes would be prohibited. All zones would allow hikers, horses, and pack animals.

Some routes could be closed (temporarily or permanently) to protect research sites or for inventory purposes. Other routes could be closed and rehabilitated to protect scientific resources, or could be turned into trails.

Authorized users would be allowed motorized access not allowed to the general public. Authorized users could include grazing permittees, researchers, and others carrying out authorized activities under a permit, or other authorization. Routes designated open for certain administrative purposes (180 miles) are shown in Map 2.5. These routes would be gated and locked. Access would be strictly limited to a specific time period and number of trips, and would only be granted for legitimate and specific purposes. Maintenance would be the minimum required to serve the administrative purpose. If the administrative purpose were to cease, the route would be closed.

Open routes could be maintained up to their current condition within the current disturbed areas; no widening, new pullouts, passing lanes, or other travel surface upgrades could occur. Maintenance work would focus on spot repairs. Researchers would be allowed to request maintenance or upgrades of routes needed to access research sites.

Trail construction and maintenance would be allowed, mainly for research and resource protection, in the Intensive, Management Research, and Transition Zones. Trail construction would not be allowed in the Landscape Research Zone. Maintenance would be allowed only for resource protection in this zone.

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Map 2.5: Transportation Alternative C

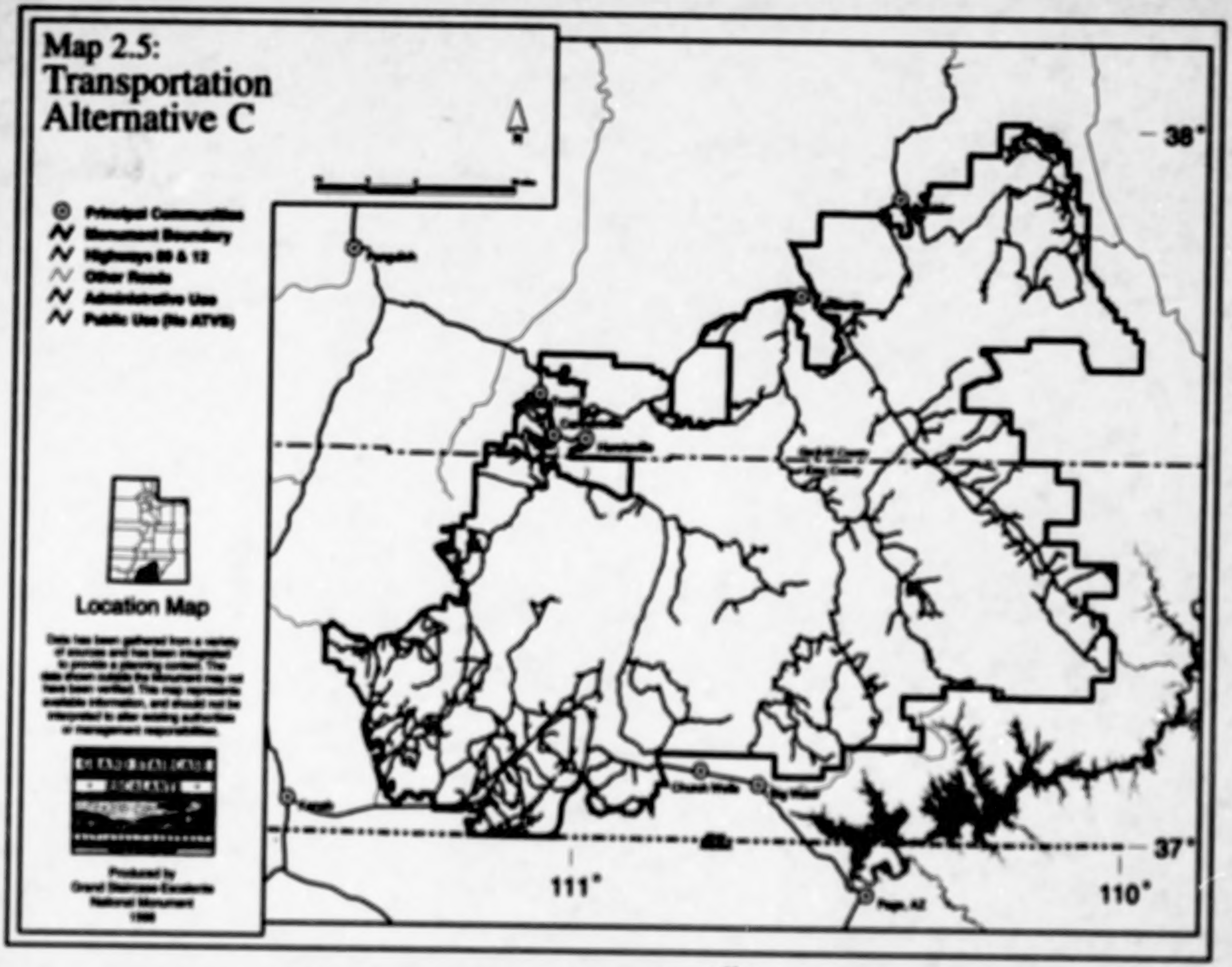

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TABLE 2.3
ALTERNATIVE C MANAGEMENT ZONES

	INTENSIVE (151,829 acres - 9%)	MANAGEMENT RESEARCH (350,992 acres - 21%)	TRANSITION (230,526 acres - 14%)	LANDSCAPE RESEARCH (952,352 acres - 56%)
Monument Resources				
Vegetation manipulation	• allow the following: -mechanical -chemical -biological -hand cutting -management ignited fire	• allow the following: -mechanical -chemical -biological -hand cutting -management ignited fire	• not allowed	• allow the following without the use of motorized/mechanized equipment: -chemical -biological -hand cutting -management ignited fire
Research				
Non-surface dicturbing research	• encouraged	• encouraged	• encouraged	• encouraged
Surface disturbing research	• allowed for scientific purposes	• accommodate some surface disturbing research	• generally not allowed in this zone • exceptions made for unique research opportunities	• generally not allowed in this zone • exceptions made for unique research opportunities
Facilities and Use Management				
Parking area and trailhead construction	• allowed	• allowed	• not allowed	• not allowed

	INTENSIVE (151,029 acres - 9%)	**MANAGEMENT RESEARCH (350,992 acres - 21%)**	**TRANSITION (230,526 acres - 14%)**	**LANDSCAPE RESEARCH (952,352 acres - 56%)**
Signing	• directional, informational, and interpretive signs encouraged	• allow directional and informational signs	• allow directional and informational signs	• allow only where required for resource protection
Interpretive sites and picnic areas	• encouraged, as needed	• allowed only for resource protection purposes	• not allowed	• not allowed
Toilets	• as needed	• as needed	• maintain existing toilets	• temporary facilities to accommodate research and education activities
Camping	• allow dispersed camping • designate camping areas in Escalante and Paria/Hackberry Canyons	• allow dispersed camping	• allow dispersed camping	• allow dispersed camping
Campfires	• campfires allowed, except in the Escalante and Paria/Hackberry Canyons	• campfires allowed	• campfires allowed	• campfires not allowed

	INTENSIVE (151,829 acres - 9%)	MANAGEMENT RESEARCH (350,992 acres - 21%)	TRANSITION (230,526 acres - 14%)	LANDSCAPE RESEARCH (952,352 acres - 56%)
Group size	• group limit of 50 people and/or animals • group limit of 12 people and/or animals and permit required for overnight stays in the Escalante Canyons and Paria/Hackberry area	• group limit of 50 people and/or animals	• group limit of 50 people and/or animals	• group limit of 12 people and/or animals
Allocations	• could be utilized to protect Monument resources	• could be utilized to protect Monument resources	• could be utilized for backcountry use	• could be utilized for backcountry use in areas of sensitivity or high scientific value
Competitive and special events	• allowed by permit	• allowed by permit	• not allowed	• not allowed
Outfitters/guides	• permitted as appropriate to this zone	• permitted as appropriate to this zone	• no outfitter/guide permits	• permitted as appropriate to this zone
Communication sites and utility rights-of-way (pipelines, power lines, etc.)	• considered on a case-by-case basis	• considered on a case-by-case basis	• not allowed	• not allowed
Filming	• not allowed	• not allowed	• not allowed	• not allowed

	INTENSIVE (151,029 acres - 9%)	MANAGEMENT RESEARCH (350,992 acres - 21%)	TRANSITION (230,526 acres - 14%)	LANDSCAPE RESEARCH (952,352 acres - 56%)
Transportation and Access				
Access	• 470 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • no routes designated for non-street legal ATV and dirt bike use • close/rehabilitated some routes to protect significant scientific resources • turn some closed routes into trails • allow hikers, horses, and pack animals	• 510 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • no routes designated for non-street legal ATV and dirt bike use • routes may be closed (temporarily or permanently) to protect research sites • allow horses, hikers, and pack animals	• 173 miles of routes designated open for street legal motorized and mechanized vehicles, including mountain bicycles • no routes designated for non-street legal ATV and dirt bike use • temporary route closures to inventory resources • allow horses, hikers, and pack animals	• 34 miles of routes designated open for street legal motorized and mechanized vehicles, including mountain bicycles • no routes designated for non-street legal ATV and dirt bike use • access for authorized administrative uses and researchers on a case-by-case basis • some closing and rehabilitating of routes • allow hikers, horses, or pack animals
Trail construction	• allowed for research and resource protection	• allowed for research and resource protection	• allowed for research and resource protection	• not allowed
Trail maintenance	• allowed	• allowed	• allowed	• allowed for resource protection only

ALTERNATIVE D

INTRODUCTION

This alternative would emphasize preservation of the primitive, undeveloped nature of the Monument through the stewardship of intact natural systems. The primal character of the land itself has helped to both create and preserve the important geological, paleontological, archeological, historical, and biological resources of the Monument. This alternative would maximize protection of the natural environment, while enhancing its remote character by limiting travel corridors and visitation.

Visitor use would be focused on the periphery of the Monument, with limited access and visitor use in the interior. A wide variety of developed trails, interpretive sites, and other visitor facilities would be provided at the periphery of the Monument, near local communities. Elsewhere, facilities would be provided only where necessary for public safety or for the protection of Monument resources. Recreational uses would be restricted by group size, permits, and possible allocation. Utility lines, competitive events, and other uses would also be restricted in the remote zones to minimize resource impacts in the interior. The approach of this alternative would provide economic opportunities for local communities by encouraging development of visitor services, such as interpretive centers and campgrounds, outside the Monument.

Research would be an important component of this alternative, and would be encouraged to the extent compatible with supporting the land's primitive and remote character. Researchers would be subject to the same stipulations as other backcountry users, except in limited circumstances where unique and outstanding research opportunities warrant strictly controlled exceptions. Likewise, ground disturbing research, or other research that would conflict with the primitive and remote character of the Monument, would not be allowed, except in cases of unique opportunities with high scientific value.

In Alternative D, three zones are used to illustrate where different management strategies would be employed (Map 2.6). More detailed management descriptions follow the zone descriptions.

Enhanced Zone (113,814 acres - 7 percent of the Monument)

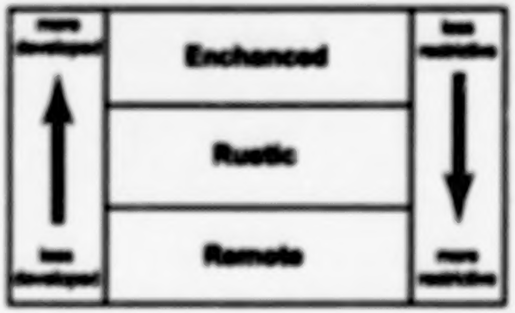
This zone provides the widest range of developed facilities and recreation opportunities on the Monument's periphery, close to communities surrounding the Monument. All access would be on routes accessible to passenger cars, to selected points of interest which focus on day-use opportunities.

Rustic Zone (177,152 acres - 10 percent of the Monument)

This zone focuses on smaller areas where motorized and mechanized travel would be allowed on routes designated open, while retaining the remote character of the zone. New facilities would be allowed only where needed to protect Monument resources.

Remote Zone (1,393,933) acres - 83 percent of the Monument)

This zone highlights natural systems in large areas by eliminating motorized/mechanized access and activities to maintain natural systems and Monument resources.



MONUMENT RESOURCES

Air Quality

In this alternative, the BLM would pursue obtaining a Prevention of Significant Deterioration Class I Air Quality redesignation for the Monument. This objective could be reached by working with the State of Utah to pursue redesignation legislation.

Water

The BLM would request that the State of Utah accelerate development of total maximum daily loads (TMDL) for 303d waters within the Monument, and if requested, would work with the Utah Department of Environmental Quality in conducting the TMDL analyses.

Water quality monitoring would be implemented when ground disturbance or other factors could adversely affect water quality. Mitigation would be required if adverse effects were detected.

Vegetation

Vegetation manipulation, including hand cutting (including with power-tools), limited chemical treatment, and management ignited fire, would be allowed to some degree in all zones. The emphasis would be the protection of sensitive resources. Use of fire for hazardous fuel reduction could be used in the Enhanced Zone.

Animal Damage Control

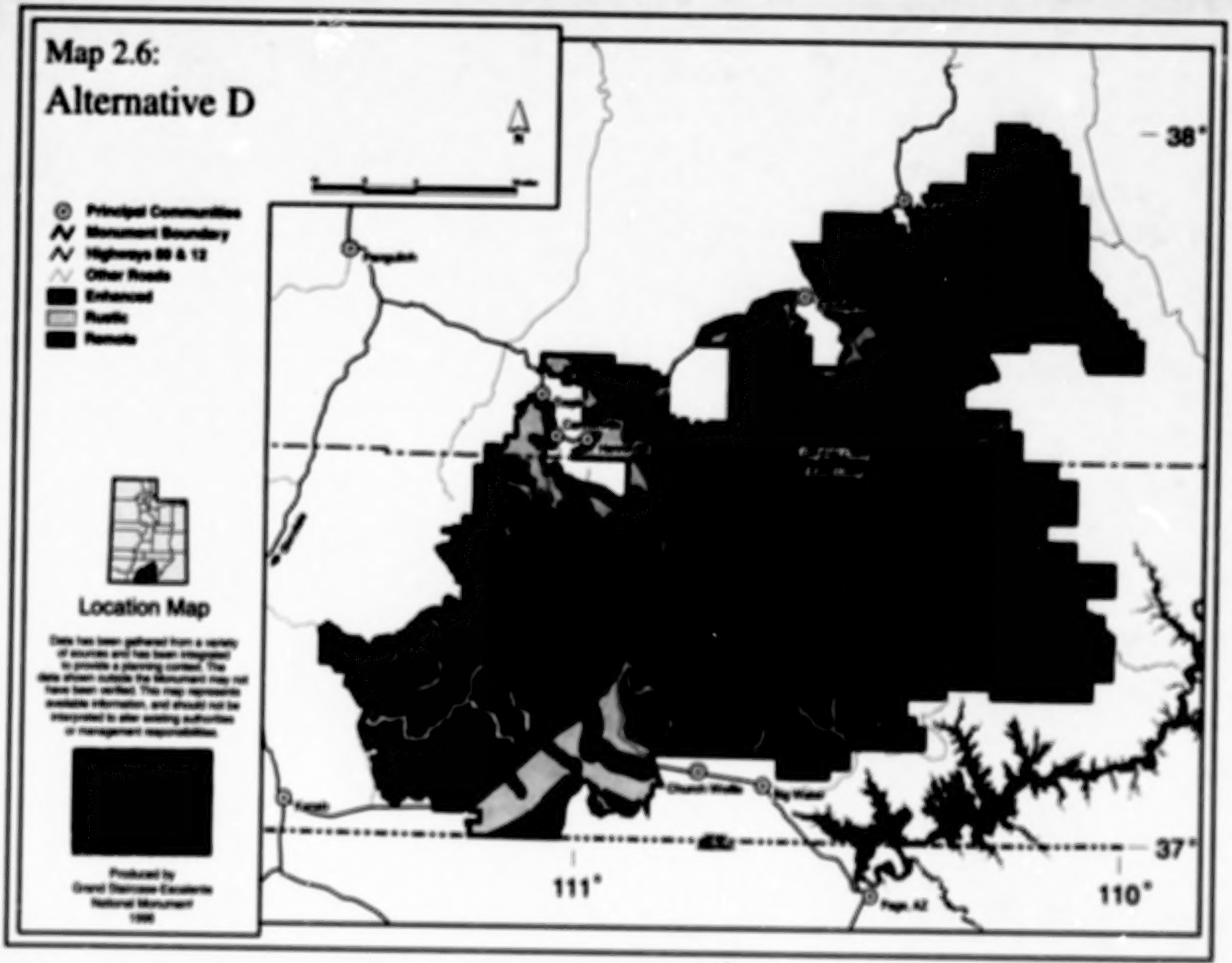
In this alternative, no animal damage control activities would take place within the Monument.

Wild and Scenic Rivers

In this alternative, all of the 25 eligible river segments (330 miles) (see Table 3.4 in Chapter 3 and Appendix 4) would be determined suitable and would be recommended for Congressional designation into the National Wild and Scenic River System. These segments are shown on Map 2.7. Their tentative classifications and a

Map 2.6:

Alternative D



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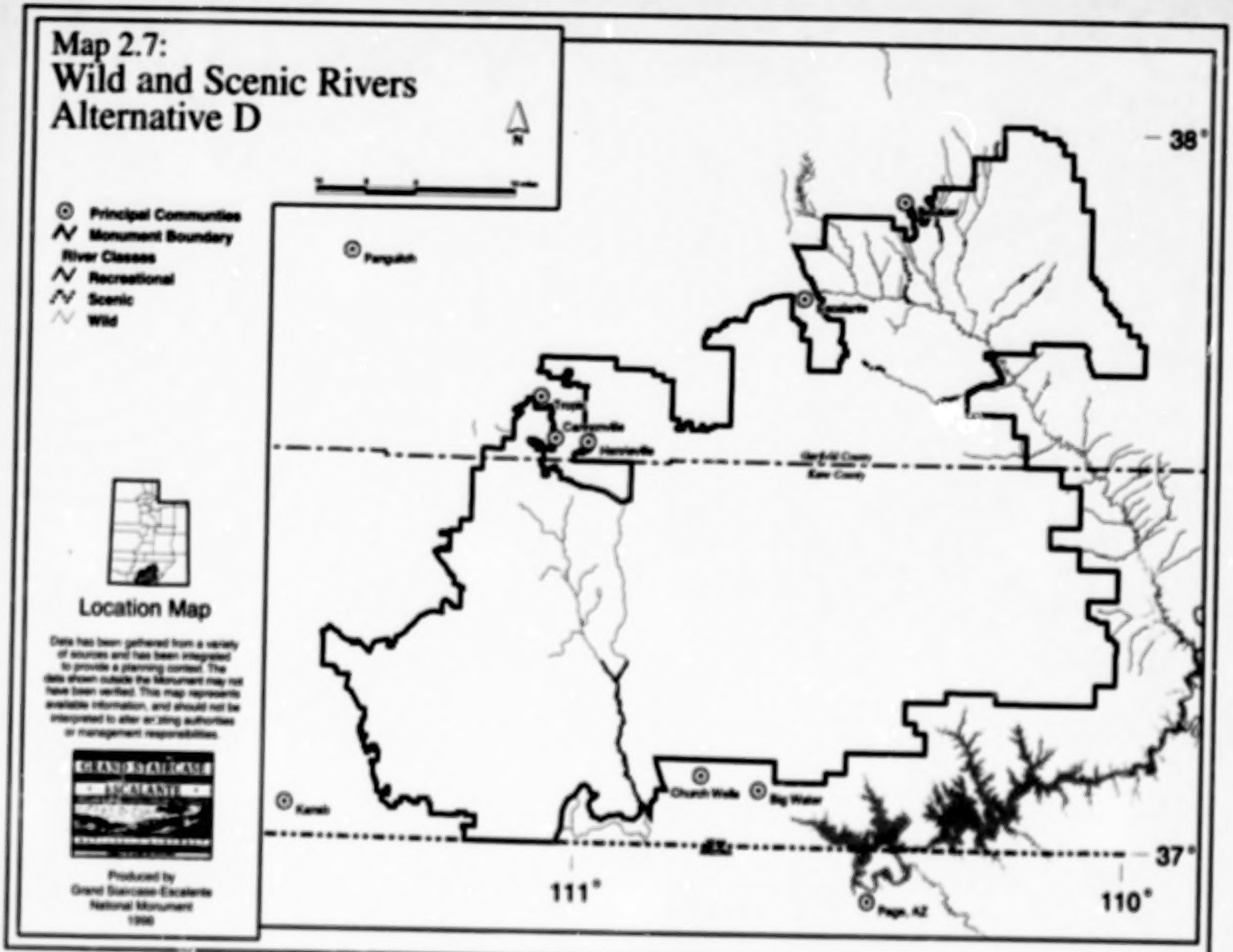
Map 2.7:
Wild and Scenic Rivers
Alternative D



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rationale for their suitability determination are described in Appendix 5.

The BLM would manage suitable segments for the preservation of outstandingly remarkable values, under the prescriptions and directions of the Monument Management Plan.

The tentative classifications in this document were chosen to be consistent with the zones in each alternative.

RESEARCH

Ground disturbing research would be allowed, with mitigation, in the Enhanced Zone. In this zone all research would have a public interpretive component as a requirement. Research in this alternative would require a permit and would be closely regulated. In the Rustic and Remote Zones, non-surface disturbing research would be encouraged. Surface disturbing research would be allowed in the Rustic and Remote Zones only if it could not be done elsewhere, and was of high scientific value.

FACILITIES AND USE MANAGEMENT

The Escalante Canyons and Paria/Hackberry area would continue to be managed intensively as special recreation management areas. Management prescriptions for these areas are described in Appendix 3.

As in all alternatives, visitor centers and Monument administrative facilities would be located outside the Monument, in the nearby communities.

Numerous visitor day-use facilities and signs would be encouraged as necessary for visitor use, safety, and for the protection of sensitive resources in the Enhanced Zone. These facilities could include pullouts, parking areas, trailheads, toilets, and picnic areas. Interpretive sites and signs highlighting the archaeological, biological, geological, paleontological, and historic resources of the Monument would be common in the Enhanced Zone. Limited facilities and signs, for the sole purpose of resource protection or visitor safety, would be allowed in the Rustic Zone. Signs in the Remote Zone would be for emergency resource protection only. In the Remote Zone, construction of other facilities would not be allowed, and existing facilities would be removed unless they were in place to protect sensitive resources. Interpretation in the Remote Zone would be off-site.

Established camping facilities at Calf Creek and Deer Creek in the Enhanced Zone would be upgraded to the level identified in the existing management plans for these recreation areas. In the Rustic and Remote Zones, camping would be allowed in designated primitive campsites. No dispersed camping would be allowed within ½ mile of designated primitive campsites or developed campgrounds, unless further restricted by the zone prescription, but would be allowed elsewhere. Allocations could be implemented to keep numbers low. Reservation systems would be established to accomplish this in highly used areas.

Campfires would be allowed, with the use of fire pans and in fire grates, in all zones except the Escalante Canyons and the Paria/Hackberry area, where no fires would be allowed.

All persons staying overnight in the Monument would be required to obtain a permit. The group size limit in the Enhanced Zone would be 25 people and/or animals. In the Rustic and Remote Zones, the group size would be limited to 12 people and/or animals. Exceptions for larger groups would be limited to specific areas in the Rustic Zone and would not be allowed in the Remote Zone. To keep use at low levels, limitations on numbers of people and/or animals could be implemented in the Rustic and Remote Zones. Use limits could be implemented in all zones for research, groups, and overnight use.

Competitive and special events would only be allowed by permit in the Enhanced Zone.

In order to protect specific sensitive archaeological or paleontological sites, visitation to some sites by the public would require the services of outfitters and guides. Outfitters and guides would be available to provide a full range of opportunities for the public. Outfitter and guide use must comply with the constraints of the zone, and with allocation and use limits set by the BLM.

New rights-of-way would be discouraged in this alternative. New construction could be allowed in the Enhanced Zone with mitigation. No new rights-of-way, except as provided in the valid existing rights section, would be allowed and low impact technology for maintenance would be required in the Rustic and Remote Zones.

Minimum impact filming would be allowed in the Enhanced Zone by permit.

No new water developments would be allowed in this alternative. Existing water developments would be evaluated to determine compatibility with the protection of Monument resources. Incompatible water developments would be removed, and the area rehabilitated.

TRANSPORTATION AND ACCESS

In this alternative, cross-country vehicle travel would be prohibited, and all routes would be closed to motorized or mechanized vehicle use unless designated open. Vehicles would be allowed to operate only on routes designated open. This approach would be consistent with that of the State of Utah, the United States Forest Service, and other land managers in the area.

Street legal motorized vehicles, including four-wheel-drive and mechanized vehicles (including mountain bicycles), would be allowed on 760 miles of routes designated open in the Rustic and Enhanced Zones (Map 2.8). No routes would be designated open in the Remote Zone. Closed routes would either be rehabilitated or turned into trails. Non-street-legal ATVs and dirt bikes would be prohibited in all zones. All zones would allow hikers, horses, and pack animals.

Authorized users would be allowed motorized access not allowed to the general public. Authorized users could include grazing permittees, researchers, and others carrying out authorized activities under a permit, or other authorization. Routes designated open for administrative purposes (30 miles) are shown in Map 2.8. These routes would be gated and locked. Access would be strictly limited to a specific time period and number of trips, and would only be granted for legitimate and specific purposes. Maintenance of these administrative routes would be the minimum required to serve the administrative purpose. If the administrative purpose were to cease, the route would be closed.

Open routes could be maintained to the current standard and within the current disturbed areas; no widening, new pullouts, passing lanes, or other travel surface upgrades would occur.

All types of trails could be developed in the Enhanced Zone, including fully accessible interpretive trails. Trails which limit access to specific user groups could be established to reduce conflicts between these groups (for example, there could be trails for hiking only, with no horses, pack animals, or mountain bicycle travel permitted). Construction of trails for the protection of sensitive resources would be allowed in the Rustic Zone. Maintenance would be focused on day-use trails. New trail construction would be permitted in the Remote Zone only to protect sensitive resources. Some maintenance of existing trails would be allowed, with the emphasis on rehabilitating social trails.

Map 2.8: Transportation Alternative D

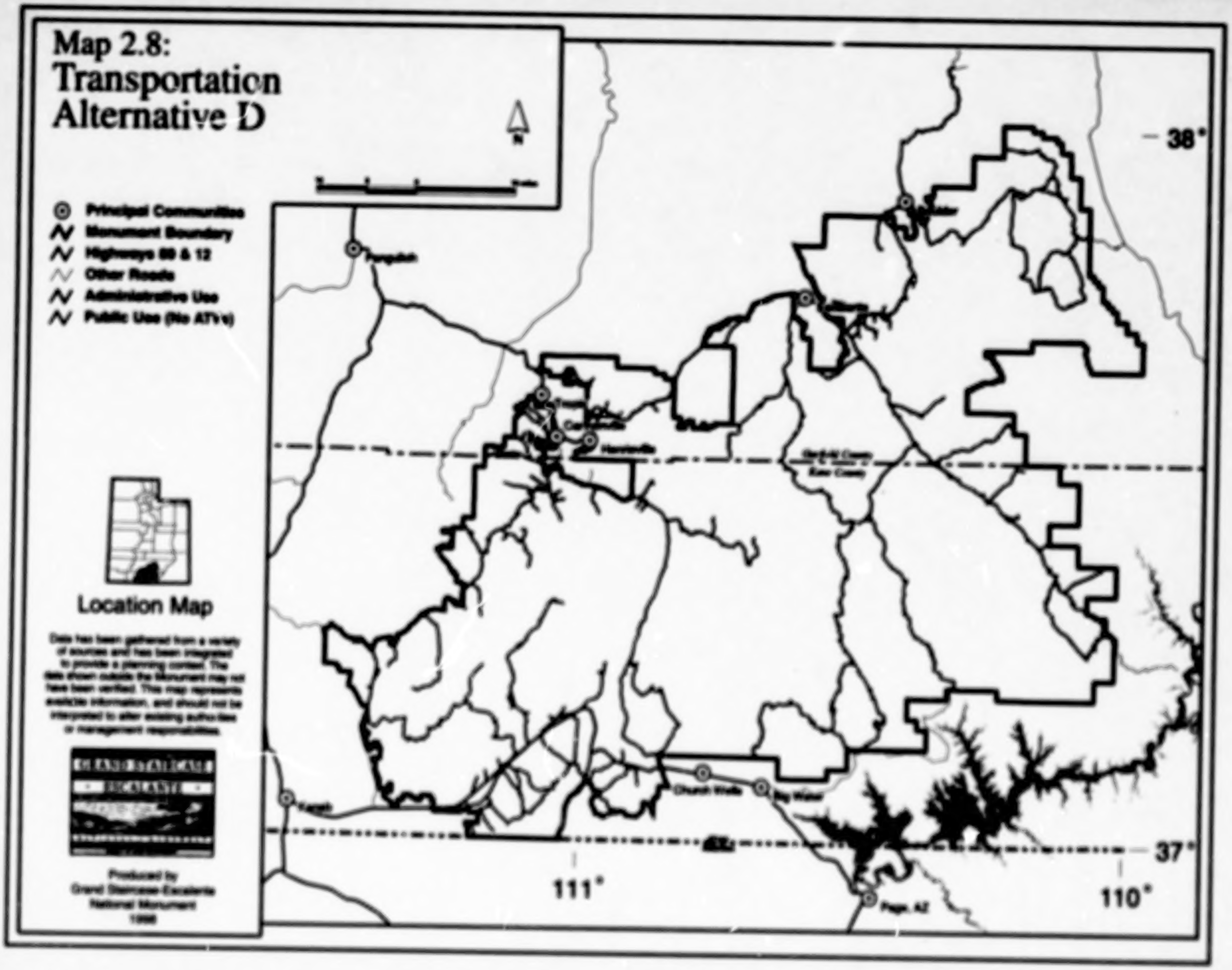

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TABLE 2.4
ALTERNATIVE D MANAGEMENT ZONES

	ENHANCED (113,814 acres - 7%)	RUSTIC (177,152 acres - 10%)	REMOTE (1,393,933 acres - 83%)
Monument Resources			
Vegetation manipulation	• allow the following for protection of sensitive resources only: -hand cutting -limited chemical -management ignited fire for hazardous fuel reduction	• allow the following for protection of sensitive resources only: -hand cutting -limited chemical -management ignited fire	• allow the following for protection of sensitive resources only: -hand cutting -limited chemical -management ignited fire
Research			
Non-surface disturbing research	• encourage these methods • allow by permit	• encourage these methods • allow by permit	• encourage these methods • allow by permit
Surface disturbing research	• allow with permit and appropriate mitigation • all research would have a public interpretive component	• allow with permit only if it could not be done elsewhere and was of high scientific value	• allow with permit only if it could not be done elsewhere and was of high scientific value
Facilities and Use Management			
Parking area and trailhead construction	• construct as necessary for visitor needs and to protect sensitive resources • encourage interpretive sites • motorized pullouts or trails highlighting Monument resources	• only to protect sensitive resources and for safety	• no new trailhead construction
Signing	• provide extensive interpretive and directional signs	• only to protect sensitive resources and for safety	• only for emergency resource protection

	ENHANCED **(113,814 acres - 7%)**	**RUSTIC** **(177,152 acres - 10%)**	**REMOTE** **(1,393,933 acres - 83%)**
Interpretive site and picnic areas	• provide day-use facilities • motorized pullouts or trails highlighting Monument resources	• only to protect sensitive resources	• no new construction • all interpretation off-site • remove any exi[illegible] facilities, unless necess[illegible] sensitive resource pro[illegible]
Toilets	• provide adequate sanitation facilities	• only to protect sensitive resources	• no new con[illegible]
Camping	• continue Calf Creek and Deer Creek campground development, as per plan • dispersed camping allowed	• designate primitive campsites • allocations may be implemented in this zone • reservations in highly used areas • dispersed camping allowed	• designate primitive campsites • allocations may be implemented in this zone • reservations in highly used areas • dispersed camping allowed
Campfires	• no open fires in the Escalante canyons and the Paria/Hackberry area • fire pans or grates in all other areas	• fire pans or grates only	• fire pans or grates only
Group size	• group size limit of 25 people and/or animals	• group size limit of 12 people and/or animals • some larger groups in selected areas (i.e. Hole-in-the-Rock Trail, Dance Hall Rock, etc.) by permit	• group size limit of 12 people and/or animals
Allocation	• Allocations could be implemented for: -overnight use -research -groups	• Allocations could be implemented for: -overnight use -research -groups	• Allocations could be implemented for: -overnight use -research -groups

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CHAPTER 2- ALTERNATIVE D

	ENHANCED (113,814 acres - 7%)	**RUSTIC (177,152 acres - 10%)**	**REMOTE (1,393,933 acres - 83%)**
Competitive and special events	• by permit only	• not allowed	• not allowed
Outfitters/guides	• use to provide a full range of opportunities for visitors • use to provide services to specific sensitive archaeological or paleontological sites. Visitation to these sites by the public would require an outfitter/guide. • must comply with constraints of zone and allocation and use limits	• use to provide services to specific sensitive archaeological or paleontological sites. Visitation to these sites by the public would require an outfitter/guide. • must comply with constraints of zone and allocation and use limits	• use to provide services to specific sensitive archaeological or paleontological sites. Visitation to these sites by the public would require an outfitter/guide. • must comply with constraints of zone and allocation and use limits
Communication sites and utility rights-of-way (pipelines, power lines, etc.)	• new construction allowed with mitigation	• no new rights-of-way • maintain existing with appropriate lowest impact technology	• no new rights-of-way • maintain existing with appropriate lowest impact technology
Filming	• minimum impact allowed by permit	• not allowed	• not allowed
Transportation and Access			
Access	• 203 miles of designated routes open to street legal motorized and mechanized vehicles, including mountain bicycles • close and rehabilitate/restore some routes • turn some closed routes into trails • allow hikers, horses, and pack animals • non-street legal ATV and dirt bike use prohibited	• 557 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • close and rehabilitate/restore some routes • turn some closed routes into trails • allow hikers, horses, and pack animals • non-street legal ATV and dirt bike use prohibited	• prohibit motorized and mechanized vehicles, including mountain bicycles • close and rehabilitate existing routes • allow hikers, horses, and pack animals • non-street legal ATV and dirt bike use prohibited

	ENHANCED (113,814 acres - 7%)	RUSTIC (177,152 acres - 10%)	REMOTE (1,393,933 acres - 83%)
Trail construction	• develop all levels of trails • focus on day-use opportunities • fully accessible interpretive trails	• allowed only to protect sensitive resources	• allowed only to protect sensitive resources
Trail maintenance	• maintain trails	• minimal level of maintenance	• minimal level of maintenance • focus on rehabilitation of social trails

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ALTERNATIVE E

INTRODUCTION

This alternative would emphasize and facilitate a full range of developed and undeveloped recreational opportunities for visitors, while relying heavily upon public education and visitor use management to protect Monument resources. Consistent with all aspects of the Proclamation and the planning criteria, this alternative would emphasize the element of managing recreational activities for enjoyment of visitor experiences. It would employ a zoning system designed to provide numerous recreational opportunities, ranging from more developed, directed experiences, to less developed, primitive, and self-directed experiences. The intent would be to maximize recreational opportunities for visitors in a manner consistent with the protection of Monument resources. A proactive visitor services program would put emphasis on information, education, interpretation, and stewardship. Communities would be integral to dispersing information and providing visitor services.

In this alternative, some areas would have routes designated for motorized travel, while other areas would be closed to these uses, emphasizing access by foot or on horseback. To accommodate current and expected visitation, signs and facilities such as developed campgrounds, picnic areas, and interpretive sites would be focused in the more developed areas and along major access routes. Other uses, including utility lines and other rights-of-way, commercial operations, fuelwood cutting, and competitive events, would be managed under permit or other systems to ensure resource protection.

Consistent with the focus on recreation and the visitor experience, recreation activities would generally take precedence over all other permitted land uses in the event that irreconcilable conflicts develop. In carrying out research projects, researchers would be subject to the access criteria established for the various zones; only limited exceptions for significant research opportunities would be made. Research would be prioritized by zone, with the highest priority placed on researching highly disturbed areas. Priority would also be given to projects with an outreach and education component aimed at promoting stewardship of Monument resources.

The level of development and directed recreational opportunities would be greater in the Scenic Highways Zone than in the Primitive Zone. Recreational experiences and levels of development would be similar in the Primitive Motorized and Primitive Zones, with the major difference being motorized access. The same is true for the Backcountry and Foot and Hoof Zones. Map 2.9 depicts the proposed zones, and a more detailed description follows.

Scenic Highways (28,133 acres - 2 percent of the Monument)

This zone would provide opportunities for visitors to see and experience the Monument while basing their activities in any one of the communities surrounding the Monument. Easily accessible trails and sites would be identified and developed to explore the biological, geological, paleontological, archeological, and historic resources near Highways 12 and 89. Activities and uses would be coordinated with the Utah Department of Transportation, local governments, and other adjacent Federal and state land managers to ensure safe and reasonable access to the widest range of visitors.

Rural (35,140 acres - 2 percent of the Monument)

This zone would provide facilities and opportunities similar to the Scenic Highways Zone, but routes and other opportunities would be farther from the communities. These routes would be accessible to most visitors in dry weather, where users would be cautioned to be prepared for a more remote experience.

Backcountry (155,085 acres - 9 percent of the Monument)

In this zone, visitors would find opportunities to experience the backcountry of the Monument. Trailheads and designated primitive campsites would enhance the backcountry experience. While two-wheel-drive access would be possible, most visitors would not feel comfortable driving a typical street vehicle into this zone.

Foot and Hoof (363,437 acres - 22 percent of the Monument)

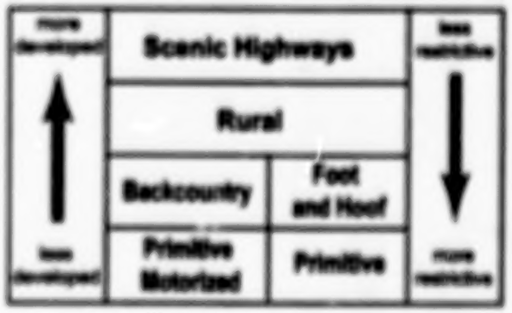
Visitors who want to experience the Monument by foot or on horse would be directed to and provided with some information about this zone. Encounters with other people would be rare. Visitors could experience a sense of self-discovery regarding the scientific and historic resources that are found in the Monument.

Primitive Motorized (428,329 acres - 25 percent of the Monument)

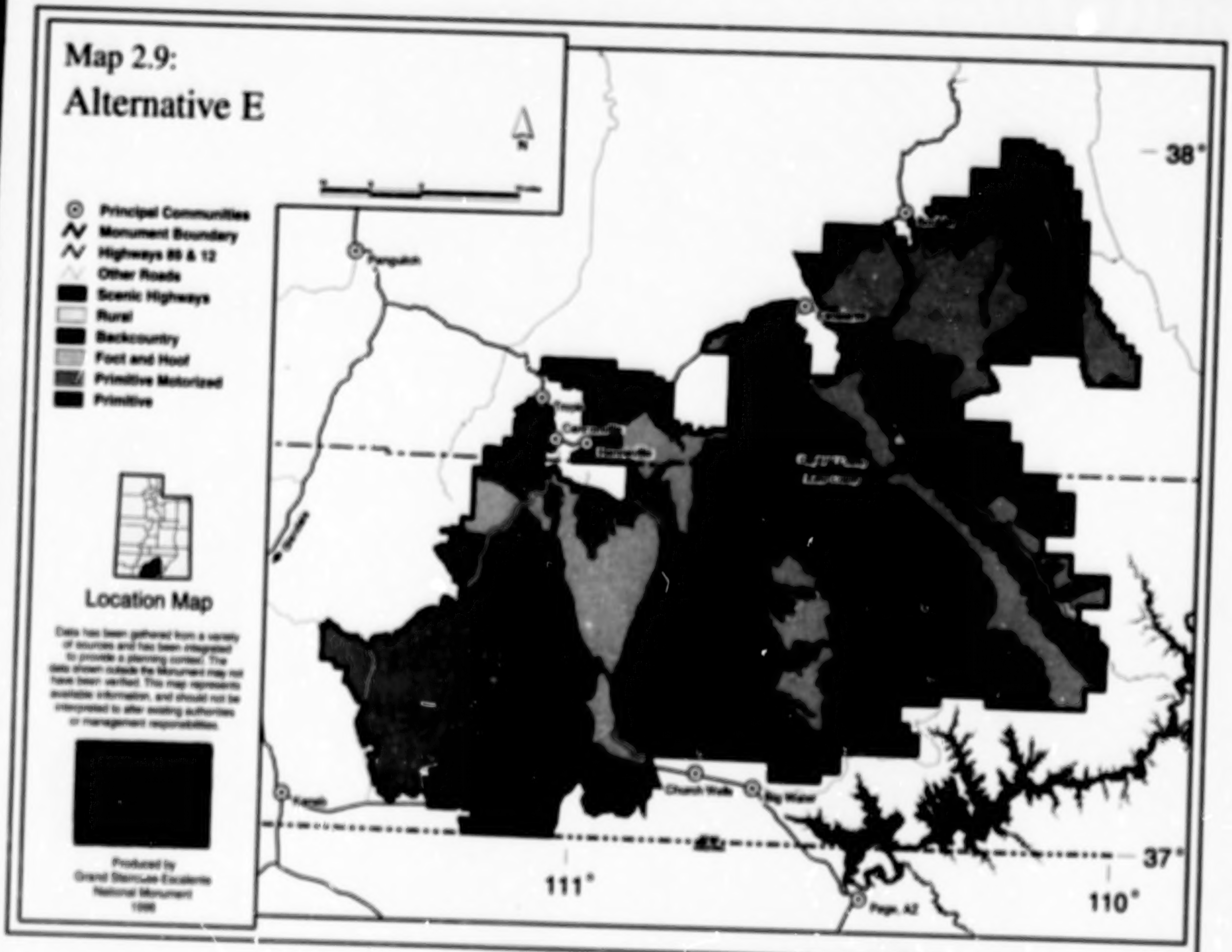
This zone would accommodate those visitors who desire a remote experience, an adventure, or want to experience the Monument in a four-wheel-drive vehicle. Visitors would be encouraged to discover the Monument on their own. Interpretive handouts would be distributed to teach sensitive, low impact use. Access would occur along the designated routes.

Primitive (674,775 acres - 40 percent of the Monument)

This zone would be available for non-mechanized exploration and discovery. It would be kept rough and rugged, and limited specific information would be provided about the special features in this zone.



Map 2.9:
Alternative E



Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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MONUMENT RESOURCES

Air Quality

The Monument would continue to be managed as a Prevention of Significant Deterioration Class II area as designated by the Clean Air Act.

Water

Water quality monitoring would be implemented when ground disturbance or other factors could adversely affect water quality. Mitigation would be required if adverse effects were detected.

Vegetation

Vegetation manipulation would be allowed, as needed, in the Scenic Highways, Rural, and Backcountry Zones using the following techniques: mechanical, chemical, biological, handcutting, and management ignited fire. Hand cutting and management ignited fire would be allowed in the Primitive Motorized Zone. Management ignited fire would be allowed in the Foot and Hoof Zone. No vegetation manipulation would be allowed in the Primitive Zone.

Animal Damage Control

Animal damage control activities would be restricted where they conflict with recreational use. In addition, consistent with the objectives for management of fish and wildlife that are common to all alternatives (see Management Common to all Alternatives), animal damage control activities would be limited to those that achieve and maintain natural animal populations, population dynamics, and population distributions, or which do not conflict with that objective.

Wild and Scenic Rivers

In this alternative, 17 of the 25 eligible river segments (252 miles) (see Table 3.4 in Chapter 3 and Appendix 4) would be determined suitable and would be recommended for Congressional designation into the National Wild and Scenic River System. The eight eligible river segments not found suitable would be: Dry Hollow Creek, Cottonwood Canyon, Lower Horse Canyon, Wolverine Creek, Little Death Hollow, Phipps Wash, unnamed tributary west of Calf Creek, and parts of Harris Wash and side canyons into The Gulch. The suitable segments, are shown on Map 2.2. A rationale for their suitability determinations are described in Appendix 5.

The BLM would manage suitable segments for the preservation of outstandingly remarkable values, under the prescriptions and directions of the Monument Management Plan. River segments determined unsuitable would be managed under the direction and prescriptions of the Monument Management Plan.

The tentative classifications in this document were chosen to be consistent with the zones in each alternative.

RESEARCH

Non-surface disturbing research would be encouraged at visitor sites to protect resources and to be used as an interpretive tool in the Scenic Highways, Rural, Backcountry, and Foot and Hoof Zones. The Primitive Motorized and Primitive Zones would have priority for inventory and field study.

Surface disturbing research would be permitted in certain areas if conducted as an interpretive tool in the Scenic Highways, Rural, and Backcountry Zones. It would also be allowed in the Foot and Hoof, Primitive Motorized, and Primitive Zones, only if the research could not be conducted elsewhere.

FACILITIES AND USE MANAGEMENT

The following areas would be managed intensively as special recreation management areas: Escalante Canyons, Paria/Hackberry Area, Fiftymile Mountain, Hole-in-the-Rock Road, Highway 12, and Highway 89. The management prescriptions for these areas are described in Appendix 3.

As in all alternatives, visitor centers and Monument administrative facilities would be located outside the Monument, in the nearby communities. Within the Monument, visitor facilities would vary by zone.

Visitor day-use facilities and signs would be installed where necessary to accommodate visitor use, ensure visitor safety, and/or protect sensitive resources. These facilities could include pullouts, parking areas, trailheads, toilets, and picnic areas. Such facilities would be common in the Scenic Highways Zone, available in selected locations along Hole-in-the-Rock, Burr Trail, Skutumpah, Cottonwood Wash, and Smoky Mountain Roads, and could be found in limited locations within the Backcountry Zone. In the Foot and Hoof, Primitive Motorized, and Primitive Zones, some facilities, such as interpretive sites and picnic areas, would not be allowed. A limited number of facilities (toilets) for visitor safety or resource protection could be built.

Camping facilities would range from fully accessible, developed campgrounds (no electricity or showers), which would be located near the existing paved highways, to designated primitive campsites scattered across the Rural and Backcountry Zones. Campgrounds would only be developed in the Scenic Highways Zone if opportunities were not provided by local communities. Primitive campsites could be designated in the Foot and Hoof Zone to protect sensitive resources. Dispersed camping would be allowed in all zones, except within ½ mile of designated primitive campsites or developed campgrounds, unless further restricted by the zone prescription.

Campfires would be restricted to fire grates or fire pans in the Scenic Highways and Rural Zones. The use of fire pans, and clean-up of fire rings would be encouraged in the Backcountry, Foot and Hoof, Primitive Motorized, and Primitive Zones. In the Escalante Canyons and the Paria/Hackberry area, no campfires would be allowed.

Groups of 75 or more people and/or animals would be required to obtain a special recreation permit, and would be directed to locations within the Rural and Backcountry Zones. In the Foot and Hoof, Primitive Motorized, and Primitive Zones the group size would be limited to 12 people and/or animals.

In this alternative, permits would be required for overnight stays and for selected, designated day-use areas. The permits would primarily be used as a tool to educate people about significant resources and how to practice appropriate low impact techniques within the Monument.

Allocation systems could be implemented in the Primitive Motorized and Primitive Zones in order to retain the primitive experience. This could be expanded to the Foot and Hoof Zone if needed.

Competitive and special events would be allowed by permit in the Scenic Highways, Rural, and Backcountry Zones.

Outfitters and guides would be allowed to operate in any zone across the Monument in compliance with the constraints of the zone, and allocation and use limits set by the BLM.

Rights-of-way approvals for communication sites and other utilities would be possible in the Scenic Highways, Rural, Backcountry, and Primitive Motorized Zones, as long as the use would blend with the landscape. Aerial power lines could be allowed within the Scenic Highways and Rural Zones, if they blend with the landscape.

Minimum impact filming could occur in all zones if used as an interpretive tool.

Water developments could be used as a Management tool throughout the Monument to protect Monument resources, to facilitate visitor use, or to manage livestock and wildlife, consistent with the Proclamation, and subject to project level NEPA analysis.

TRANSPORTATION AND ACCESS

Cross-country travel by vehicle would be prohibited. All routes would be closed to motorized or mechanized vehicle use unless designated open. Vehicles would be allowed to operate only on routes designated open. This approach would be consistent with that of the State of Utah, the United States Forest Service, and other land managers in the area.

Street legal motorized vehicles, including four-wheel-drive and mechanized vehicles (including mountain bicycles), would be allowed on 1,264 miles of routes designated open in the Scenic Highway, Rural, Backcountry, and Primitive Motorized Zones (Map 2.10). No routes would be designated open in the Foot and Hoof Zone or the Primitive Zone.

All zones would be open to hikers, horses, and pack animals.

Non-street legal ATVs and dirt bikes would be restricted to those routes designated open for their use. Non-street legal ATVs and dirt bikes would be allowed on 980 miles of the 1,264 miles of routes designated open to street legal vehicles in the Scenic Highways, Rural, Backcountry, and Primitive Motorized Zones. The BLM, and Kane and Garfield Counties, would meet periodically to evaluate the routes designated as open for ATV use.

Authorized users would be allowed motorized access not allowed to the general public. Authorized users could include grazing permittees, researchers, and others carrying out authorized activities under a permit, or other authorization. Routes designated open for certain administrative purposes (84 miles) are shown in Map 2.10. These routes would be gated and locked. Access would be strictly limited to a specific time period and number of trips, and would only be granted for legitimate and specific purposes. Maintenance would be the minimum required to serve the administrative purpose. If the administrative purpose were to cease, the route would be closed.

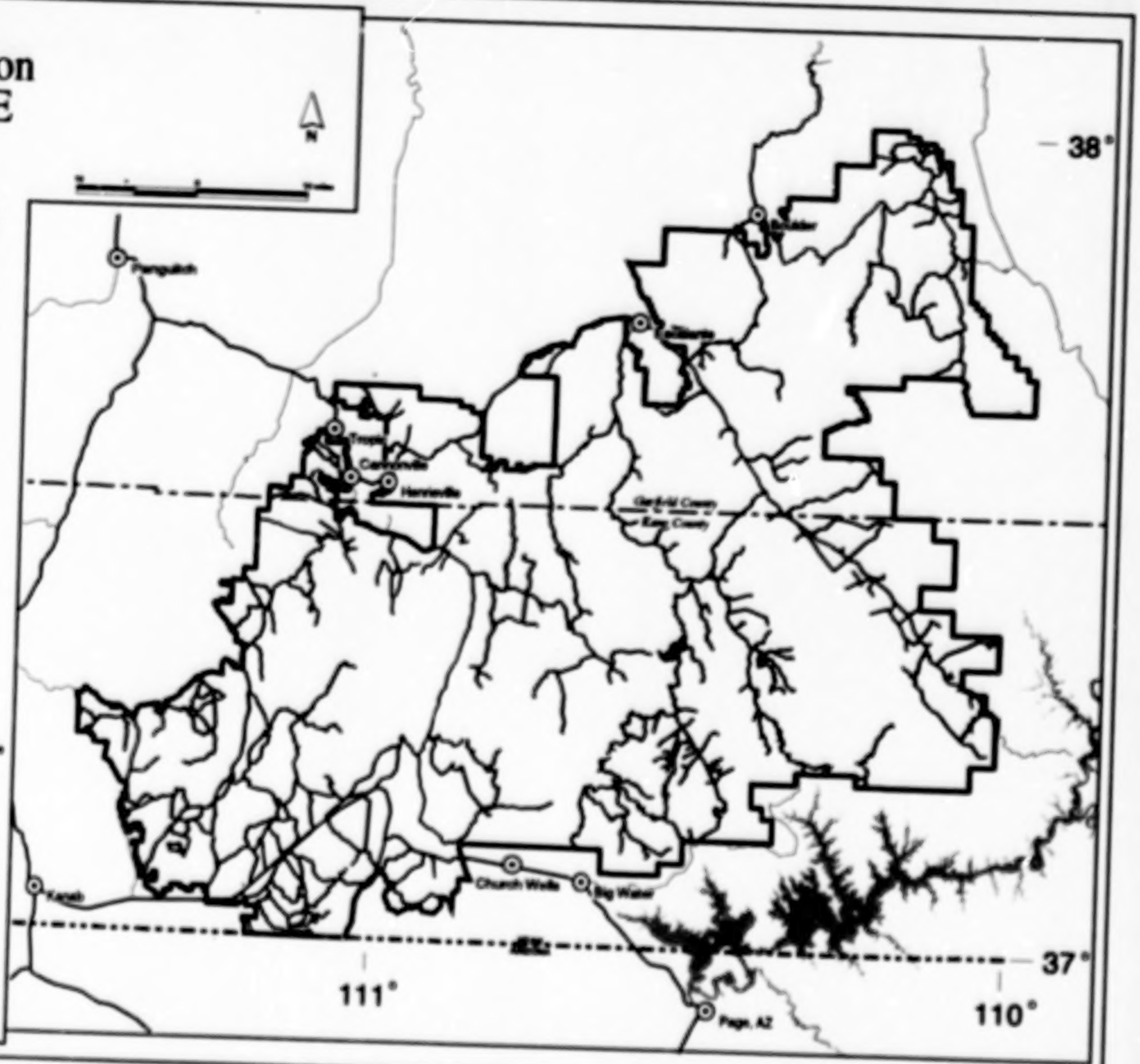
With the exception of those route segments listed below, open routes could not be upgraded beyond the current standard or beyond the current disturbed areas; no widening, new pullouts, passing lanes, or other travel surface upgrades would occur. Deviations from the current route maintenance levels would be allowed as follows (subject to Wilderness Study Area Interim Management Policy, BLM Manual H-3550-1):

- Hole-in-the-Rock Road could be upgraded to an all-weather gravel base with associated culverts and other drainage work.
- Smoky Mountain Road : Alvey Wash section could be upgraded to an all-weather gravel base with associated culverts and other drainage work.
- Cottonwood Wash Road: The first 7 to 8 miles from Highway 89 could be upgraded to a paved condition. The segment along the Paria River and the Cockscomb could be improved to an all-weather gravel surface. The segment from Grosvenor Arch to Cannonville could be paved.
- Skutumpah Road could be upgraded to an all-weather gravel base with associated culverts and other drainage work.

Trails could be constructed within the Scenic Highways, Rural, Backcountry, and Foot and Hoof Zones. These trails could range from fully accessible paved trails near the major highways, to unpaved day-use and backcountry routes. Limited maintenance of existing trails would be allowed, with the rehabilitation of social trails and roads as the major focus. No new trail construction would occur within the Primitive Motorized and Primitive Zones.

Map 2.10: Transportation Alternative E

⊙ Principal Communities
Monument Boundary
Highways 89 & 12
Other Roads
Administrative Use
Public Use (No ATVs)
Public and ATV Use



Location Map

Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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TABLE 2.5
ALTERNATIVE E MANAGEMENT ZONES

	SCENIC HIGHWAYS (28,133 acres - 2%)	RURAL (35,140 acres - 2%)	BACKCOUNTRY (155,085 acres - 9%)	FOOT AND HOOF (363,437 acres - 22%)	PRIMITIVE MOTORIZED (428,329 acres - 25%)	PRIMITIVE (674,775 acres - 40%)
Monument Resources						
Vegetation manipulation	• allow as needed: -mechanical -chemical -biological -hand cutting -management ignited fire	• allow as needed: -mechanical -chemical -biological -hand cutting -management ignited fire	• allow as needed: -mechanical -chemical -biological -hand cutting -management ignited fire	• allow: -management ignited fire	• allow: -hand cutting -management ignited fire	• not allowed
Research						
Non-surface disturbing research	• encouraged at visitor sites to protect resources and if used as an interpretive tool	• encouraged at visitor sites to protect resources and if used as an interpretive tool	• encouraged at visitor sites to protect resources and if used as an interpretive tool	• encouraged at visitor sites to protect resources and if used as an interpretive tool	• priority for inventory and field studies	• priority for inventory and field studies
Surface disturbing research	• permitted in certain areas if done as an interpretive tool	• permitted in certain areas if done as an interpretive tool	• permitted in certain areas if done as an interpretive tool	• only if it could not be done elsewhere	• only if it could not be done elsewhere	• only if it could not be done elsewhere

	SCENIC HIGHWAYS (28,133 acres - 2%)	RURAL (35,140 acres - 2%)	BACKCOUNTRY (155,085 acres - 9%)	FOOT AND HOOF (363,437 acres - 22%)	PRIMITIVE MOTORIZED (428,329 acres - 25%)	PRIMITIVE (674,775 acres - 40%)
Facilities and Use Management						
Parking area and trailhead construction	• allowed for visitor needs • to protect sensitive resources	• allowed for visitor needs • to protect sensitive resources	• allowed for visitor needs • to protect sensitive resources	• not allowed	• minimal construction	• not allowed
Signing	• high level of directional, safety, and interpretive signs	• moderate level of directional, safety, and interpretive signs	• directional signs on roads, strong safety messages • minimal signs at intersections • information and interpretive signs at trailheads and special features	• information and minimal interpretive signs at trailheads • minimal directional signs at trail intersections	• no signing except where needed to show access route as open	• none
Interpretive sites and picnic areas	• provide sites	• provide sites	• provide sites	• not allowed	• not allowed	• not allowed
Toilets	• provide adequate sanitation facilities	• provide adequate sanitation facilities	• provide where needed to protect resources	• provide where needed to protect resources using least impacting appropriate technology	• provide where needed to protect resources using least impacting appropriate technology	• not allowed

CHAPTER 2- ALTERNATIVE E

	SCENIC HIGHWAYS (28,133 acres - 2%)	RURAL (35,140 acres - 2%)	BACKCOUNTRY (155,085 acres - 9%)	FOOT AND HOOF (363,437 acres - 22%)	PRIMITIVE MOTORIZED (428,329 acres - 25%)	PRIMITIVE (674,775 acres - 40%)
Camping	• developed, fully accessible campgrounds (no electricity or showers), only if not provided by local communities • dispersed camping allowed	• identify minimal, designated primitive campsites • some fully accessible sites • dispersed camping allowed	• identify minimal, designated primitive campsites • some fully accessible sites • dispersed camping allowed	• no construction • could designate primitive campsites to protect resources • dispersed camping allowed	• no construction • dispersed camping allowed	• no construction • dispersed camping allowed
Campfires	• fires in designated fire grate or mandatory fire pan use	• fires in designated fire grate or mandatory fire pan use	• encourage fire pans or fire ring cleanup	• encourage fire pan use or fire ring cleanup • no campfires in Escalante Canyons, Paria/Hackberry area	• encourage fire pan use or fire ring cleanup	• encourage fire pan use or fire ring cleanup • no campfires in Escalante Canyons, Paria/Hackberry area
Group size	• no limit	• group limit of 75 people and/or animals • exceptions allowed under special recreation permit	• group limit of 75 people and/or animals • exceptions allowed under special recreation permit	• group limit of 12 people and/or animals	• group limit of 12 people and/or animals	• group limit of 12 people and/or animals
Allocation	• no allocations	• no allocations	• no allocations	• allocations could be used to retain primitive experience	• allocations could be used to retain primitive experience	• allocations could be used to retain primitive experience

	SCENIC HIGHWAYS (28,133 acres - 2%)	RURAL (35,140 acres - 2%)	BACKCOUNTRY (155,085 acres - 9%)	FOOT AND HOOF (363,437 acres - 22%)	PRIMITIVE MOTORIZED (428,329 acres - 25%)	PRIMITIVE (674,775 acres - 40%)
Competitive and special events	• allowed by permit	• allowed by permit	• allowed by permit	• not allowed	• not allowed	• not allowed
Outfitters/guides	• allowed if outfitter and guide activities are appropriate to this zone	• allowed if outfitter and guide activities are appropriate to this zone	• allowed if outfitter and guide activities are appropriate to this zone	• allowed if outfitter and guide activities are appropriate to this zone	• allowed if outfitter and guide activities are appropriate to this zone	• allowed if outfitter and guide activities are appropriate to this zone
Communication site and utility rights-of-way (pipelines, power lines, etc.)	• communication sites, aerial and buried lines allowed but must blend in with the landscape	• communication sites, aerial and buried lines allowed but must blend in with the landscape	• communication sites and buried lines allowed but must blend in with the landscape	• not allowed	• communication sites and buried lines allowed but must blend in with the landscape	• not allowed
Filming	• minimum impact permitted if used as an interpretive tool	• minimum impact permitted if used as an interpretive tool	• minimum impact permitted if used as an interpretive tool	• minimum impact permitted if used as an interpetive tool	• minimum impact permitted if used as an interpretive tool	• minimum impact permitted if used as an interpretive tool

CHAPTER 2- ALTERNATIVE E

	SCENIC HIGHWAYS (28,133 acres - 2%)	RURAL (35,140 acres - 2%)	BACKCOUNTRY (155,085 acres - 9%)	FOOT AND HOOF (363,437 acres - 22%)	PRIMITIVE MOTORIZED (428,329 acres - 25%)	PRIMITIVE (674,775 acres - 40%)
Transportation and Access						
Access	• 95 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 21 miles of the 95 miles of designated routes for street legal would be open for non-street legal ATVs and dirt bikes • allow hikers, horses, pack animals	• 141 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 22 miles of the 141 miles of designated routes for street legal would be open for non-street legal ATVs and dirt bikes • allow hikers, horses, pack animals	• 335 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 290 miles of the 335 miles of designated routes for street legal would be open for non-street legal ATVs and dirt bikes • allow hikers, horses, pack animals	• closed to all motorized and mechanized use, including mountain bicycles • allow hikers, horses, pack animals	• 693 miles of designated routes open for street legal motorized and mechanized vehicles, including mountain bicycles • 647 miles of the 693 miles of designated routes would be open for non-street legal ATVs and dirt bikes • allow hikers, horses, pack animals	• closed to all motorized and mechanized use, including mountain bicycles • allow hikers, horses, pack animals
Trail construction	• develop all levels of trails including fully accessible paved interpretive trails • focus on day-use opportunities	• develop day-use and backcountry trails	• develop day-use and backcountry trails	• could construct minimal new trails primarily to protect sensitive resources or to complete loops	• not allowed	• not allowed

	SCENIC HIGHWAYS (28,133 acres - 2%)	RURAL (35,140 acres - 2%)	BACKCOUNTRY (155,085 acres - 9%)	FOOT AND HOOF (363,437 acres - 22%)	PRIMITIVE MOTORIZED (428,329 acres - 25%)	PRIMITIVE (674,775 acres - 40%)
Trail maintenance	• as needed	• as needed	• as needed	• as needed	• minimally maintain	• rehabilitate social trails

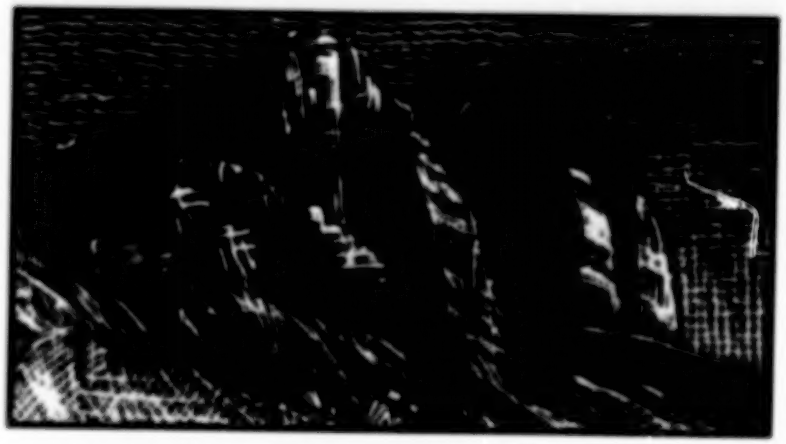

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TABLE 2.6
ALTERNATIVE COMPARISON TABLE

	ALTERNATIVE A (No Action)	**ALTERNATIVE B (Preferred)**	**ALTERNATIVE C**	**ALTERNATIVE D**	**ALTERNATIVE E**
Monument Resources					
Vegetation manipulation	• maintain existing or allow new only to protect or enhance Monument resources • management ignited fire used to restore natural systems or to reduce hazardous fuels	• the following methods could be used throughout the Monument (except as noted) to restore natural systems and to protect sensitive resources: -mechanical (prohibited on 1,038,788 acres) -chemical -biological -hand cutting -management ignited fire	• the following would be allowed on all but 230,526 acres: -mechanical (prohibited on an additional 952,352 acres) -chemical -biological -hand cutting -management ignited fire	• the following would be allowed for the protection of sensitive resources throughout the Monument: -limited chemical -hand cutting -management ignited fire to reduce hazardous fuel	• allowed as needed on 218,358 acres: -mechanical -chemical -biological -hand cutting -management ignited fire • management ignited only on 363,437 acres • management ignited fire and hand cutting on 428,329 acres • no methods allowed on 674,775 acres
Wild and Scenic Rivers	• suitability determinations would not be made on 25 eligible river segments (330 miles)	• 17 of the 25 eligible river segments (252 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS	• none of the 25 eligible river segments (330 miles) would be determined suitable	• all 25 eligible river segments (330 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS	• 17 of the 25 eligible river segments (252 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Research					
Non-surface disturbing research	• continue to support • continue to identify opportunities and priorities	• allowed and encouraged throughout the Monument • conduct or support research related to improvement of land management practices, disturbance ecology (502,237 acres) • permits required	• encouraged throughout the Monument	• allowed and encouraged, with permit, throughout the Monument	• encouraged at visitor sites to protect resources and use as an interpretive tool on 581,795 acres • priority for inventory and field studies on 1,103,104 acres
Surface disturbing research	• allowed but cannot result in the impairment of wilderness suitability	• allowed where necessary, with mitigation on 646,111 acres • allowed only in cases of unique opportunity with extremely high value, with mitigation on 1,038,788 acres • permits required	• allowed for scientific purposes on 151,029 acres • accommodate some on 350,992 acres • generally not allowed but exceptions made for unique research opportunities on 1,182,878 acres	• allowed with permit and appropriate mitigation on 113,814 acres • allowed only if it cannot be done elsewhere or if it directly relates to or is dependent on remoteness on 1,571,085 acres	• permitted if done as an interpretive tool on 218,358 acres • permitted on 1,466,541 acres only if it cannot be done elsewhere

CHAPTER 2 - ALTERNATIVE COMPARISON

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Facilities and Use Management					
Parking area and trailhead construction	• allowed, as needed, for resource protection	• allowed for a variety of purposes including visitor needs, to protect sensitive resources, or for public safety • not allowed in the majority of the Monument	• allowed in the more developed areas • not allowed in the majority of the Monument	• allowed in the more developed areas • not allowed in the majority of the Monument	• allowed for s variety of purposes including visitor needs or to protect sensitive resources • not allowed in the much of the Monument
Signing	• continue to provide as needed	• allowed for directional, safety, interpretive, and for the protection of resources	• allowed for directional, safety, interpretive, and for the protection of resources	• allowed for directional, safety, interpretive, and for the protection of resources	• allowed for for directional, safety, interpretive, and for the protection of resources
Interpretative sites and picnic areas	• none identified, develop as needed	• interpretive sites allowed to highlight resources and for resource protection • picnic areas generally not allowed, allowed only as needed	• encouraged as needed in the developed areas • allowed for resource protection • not allowed on the majority of the Monument	• range from allowed to not allowed depending on area	• provide as needed in developed areas • not allowed on the majority of the Monument
Toilets	• allowed where needed to address health and safety concerns	• provided in the more developed areas • not provided elsewhere	• provide as need in developed areas • provide temporary facilities to accommodate research	• range from allowed to not allowed depending on area	• range from allowed to not allowed depending on area

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Camping	• dispersed camping allowed on 1,684,899 acres	• dispersed camping allowed on 1,571,162 acres • dispersed camping not allowed on 113,737 acres	• dispersed camping allowed on 1,664,887 acres • camping in designated primitive sites only on 20,012 acres	• dispersed camping allowed on much of the Monument • camping in designated primitive campsites in some areas only	• dispersed camping allowed on much of the Monument
Campfires	• campfires allowed on 1,684,899 acres	• allowed in fire grates or mandatory fire pans on 143,785 acres • allowed, fire pans encouraged on 1,521,102 acres • campfires not allowed on 20,012 acres	• allowed on 712,535 acres • not allowed on 972,364 acres	• allowed in fire grates or mandatory fire pans on 1,664,887 acres • not allowed on 20,012 acres	• allowed in fire grates or mandatory fire pans on 63,273 acres • allowed, fire pans encouraged on 1,601,614 acres • campfires not allowed on 20,012 acres
Group size	• no group limit • recommended group limit of 12 in Escalante Canyons	• group limit of 25 people and/or animals on 143,785 acres • group limit of 12 people and/or animals on 1,541,114 acres	• group limit of 50 people and/or animals on 712,535 acres • group limit of 12 people and/or animals on 972,364 acres	• group limit of 25 people and/or animals on 113,814 acres • group limit of 12 people and/or animals on 1,571,085 acres	• no limit on 28,133 acres • group limit of 75 people and/or animals on 190,225 acres • group limit of 12 people and/or animals on 1,466,541 acres
Allocation	• no allocations	• could be implemented on 1,571,162 acres • would not allocate on 113,737 acres	• could be implemented on 1,684,899 acres	• could be implemented on 1,684,899 acres	• could be implemented on 1,466,141 acres • would not allocate on 218,358 acres

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Competitive and special events	• continue to manage permits approved in 1997 (2)	• not allowed on 1,684,899 acres	• allowed on 502,021 acres • not allowed on 1,182,878 acres	• allowed on 113,814 acres • not allowed on 1,571,085 acres	• allowed on 218,358 acres • not allowed on 1,466,541 acres
Outfitters/guides	• allow existing permits • no new permits	• allowed if outfitter/guide activities are appropriate to the zone on 1,684,899 acres	• allowed if outfitter/guide activities are appropriate to the zone on 1,454,373 acres • not allowed on 230,526 acres	• allowed on 1,684,899 acres but must comply with constraints of zone and allocation and use limits • some sites may require a guide	• allowed if outfitter/guide activities are appropriate to the zone on 1,684,899 acres
Communication sites and utility rights-of-way (pipelines, power lines, etc.)	• issue only those necessary on 1,684,899 acres	• communication sites (and buried and aerial lines) allowed on 646,111 acres, but must comply with zone restrictions • communication sites (no buried or aerial lines permitted) on 1,038,788 acres	• allowed on 502,021 acres • not allowed on 1,182,878 acres	• allowed on 113,814 acres • not allowed on 1,571,085 acres	• allowed on 646,687 acres but must blend with the landscape • not allowed on 1,038,212 acres
Filming	• allowed on 1,684,899 acres	• minimum impact only allowed on 646,111 acres • not allowed on 1,038,788 acres	• not allowed on 1,684,899 acres	• minimum impact only allowed on 113,814 acres • not allowed on 1,571,085 acres	• minimum impact only allowed if used as an interpretive tool on 1,684,899 acres

	ALTERNATIVE A (No Action)	ALTERNATIVE B (Preferred)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Transportation and Access					
Access routes	• 2,176 miles of routes open	• 818 miles of routes designated open for street legal vehicles • 591 miles of those routes open for street legal are also open for non-street legal ATV and dirt bike use • 229 miles of routes open for administrative purposes	• 1,187 miles of routes designated open for street legal vehicles • non-street legal ATV and dirt bike use prohibited • 180 miles of routes open for administrative purposes	• 760 miles of routes designated open for street legal vehicles • non-street legal ATV and dirt bike use prohibited • 30 miles of routes open for administrative purposes	• 1,264 miles of routes designated open for street legal vehicles • 980 miles of those routes open for street legal are also open for non-street legal ATV and dirt bike use • 84 miles of routes open for administrative purposes
Trail construction	• allowed	• trails developed for a variety of purposes: -fully accessible -focus on day-use opportunities -public safety -to protect sensitive resources	• allowed for research and resource protection • not allowed in the majority of the Monument	• trails developed for a variety of purposes: -fully accessible -day-use opportunities -to protect sensitive resources	• trails developed for a variety of purposes: -fully accessible -day-use opportunities -backcountry trails -to protect sensitive resources • not allowed in the majority of the Monument
Trail maintenance	• continue as needed	• allowed as needed and to protect sensitive resources	• allowed in general and for resource protection	• allowed in general • minimum level of maintenance	• allowed as needed

MANAGEMENT COMMON TO ALL ALTERNATIVES

INTRODUCTION

The alternatives vary in many aspects, but they are similar in many others. Rather than repeat the similar aspects in each alternative description, the procedures and actions that are the same in all alternatives are summarized alphabetically in this section. Management that is common to all alternatives would be implemented under any alternative selected, except as noted.

AIRCRAFT OPERATIONS

Aircraft takeoff and landing would be allowed only at the New Home Bench airstrip.

The BLM would work cooperatively with aircraft operators and the Federal Aviation Administration to direct overflights to appropriate management zones. The BLM intends to work cooperatively with the Department of Defense to ensure that military training routes are appropriate to Monument management.

AIR QUALITY

Prescribed burns must comply with the State of Utah Interagency Memorandum of Understanding requirements to minimize air quality impacts from resulting particulates (smoke). This procedure requires obtaining an open burning permit from the State prior to conducting a prescribed burn.

Site-specific project proposals affecting BLM and adjacent lands would be reviewed for compliance with existing laws and policies protecting the areas. Mitigation would be incorporated into project proposals to reduce air quality degradation. Projects would be designed to minimize further degradation of existing air quality. New emission sources would be required to apply control measures to reduce emissions.

There are additional air quality actions which are not common to all alternatives, which are therefore included in the descriptions of the individual alternatives

ARCHAEOLOGY/HISTORY/ PALEONTOLOGY

Archaeological, paleontological, and historic inventories would be conducted prior to route maintenance in order to identify and protect any cultural or paleontological resources present, consistent with current law and with the Proclamation. A number of Native American Indian ancestral sites within the Monument are currently used by Native American Indians. Each alternative would assure continued use of those recognized sites.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Areas of Critical Environmental Concern (ACEC) are areas within the public lands where special management attention may be required to protect important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect human life and safety from natural hazards.

The BLM is required to consider designating ACECs as part of the planning process. FLPMA provides for ACEC designation and establishes national policy for the protection of public land areas of critical environmental concern. Section 202(c)(3) of FLPMA requires the agency to give priority to the designation and protection of ACECs in the development and revision of land use plans.

Appendix 6 lists the ACEC nominations received for this planning process and describes the ACEC evaluation methods used. After careful evaluation of the resources recognized in each of the nominations, it was determined that their protection would be

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equivalent under either Monument authority or ACEC designation. Therefore, it was concluded that no ACECs were necessary, and that no ACECs would be designated under the Monument Management Plan.

COLLECTIONS

In order to carry out the intent of the Proclamation to protect historic and scientific objects, collection of Monument resources, objects, rocks, petrified wood, fossils, plants, parts of plants, animals, fish, insects or other invertebrate animals, bones, waste, or other products from animals, or of other items from within the Monument, would be prohibited. Exceptions could include collections authorized, by permit, in conjunction with authorized research or management activities; the collection of small amounts of fruits, nuts, and berries for personal, non-commercial use; the collection, under BLM permit, by Native American Indians, of certain natural materials; the collection of antlers for non-commercial use; and the collection of dead-and-down wood for immediate use in campfires, where campfires are allowed or where specified otherwise in the alternatives.

The above prohibitions shall not be deemed to diminish the responsibility and authority of the State of Utah for management of fish and wildlife, including the regulation of hunting and fishing, on Federal lands within the Monument.

COMMUNITIES

The BLM has a strong commitment to work with communities in managing the Monument. The BLM would work with local communities and utility companies on infrastructure development needs, and would actively participate in community organizations and regional coordination groups. Agreements with the counties and communities would be explored for activities such as planning, transportation, search and rescue, law enforcement, infrastructure, and tourism. The BLM currently works with the counties on some of these issues.

In Alternatives B, C, D, and E, development would be focused on the periphery of the Monument and within the communities. This would protect Monument resources, while providing economic opportunities in the communities surrounding the Monument. The communities are where visitors, and the services they require, would be concentrated.

CONSULTATION WITH NATIVE AMERICAN INDIANS

In all alternatives, the BLM would continue to consult with Native American Indian tribes before reaching decisions about traditionally associated resources, and would continue to invite the input of Native American Indian tribes in this and subsequent Monument management planning.

A number of Native American Indian ancestral sites within the Monument are currently used by Native American Indians; that use would continue to be allowed in all alternatives.

CRYPTOBIOTIC SOIL CRUSTS

Cryptobiotic soil crusts consist of lichens, mosses, and algae. Cryptobiotic crusts are formed by living organisms and their by-products, creating a surface crust of soil particles bound together by organic materials (USDA, 1997). Cryptobiotic soil crusts play an important ecological role in the functioning of soil stability and erosion, atmospheric nitrogen fixation, nutrient contributions to plants, soil-plant-water relations, seedling germination, and plant growth. The Proclamation recognizes this important ecological function. In all alternatives, prior to any ground disturbing activity, the potential effects on these crusts would be considered and steps would be taken to avoid impacts on their function, health, and distribution. Further research would be conducted on these crusts, and the results interpreted for management and education purposes.

EDUCATION AND INTERPRETATION

A comprehensive Monument education program would be developed, in which the BLM would assist educators in developing training packages and highlighting Monument resources for teachers of Kindergarten through grade 12. The BLM would also support other educational programs.

FEES

Fees for general use may be required in the future. One option would be an annual pass. Public input would be sought prior to the designation of any fee system. The implementation of any fee system is not dependent upon the alternatives in this plan.

FENCES

Fences would be used in certain circumstances to protect Monument resources, to manage visitor use, and to manage livestock, consistent with the Proclamation. Regardless of the alternative, they would be designed and constructed to blend with the landscape.

FISH AND WILDLIFE

The Proclamation establishing the Monument states: "Nothing in this proclamation shall be deemed to diminish the responsibility and authority of the State of Utah for management of fish and wildlife, including regulation of hunting and fishing, on Federal lands within the Monument." At the same time, the Proclamation refers to the "outstanding biological resources" and "important ecological values" in the Monument. These resources, which encompass entire natural systems, including fish and wildlife habitat, are among those that the BLM has been given responsibility to manage and protect. It would be the objective of the BLM to work with the State in managing fish, wildlife, and other animals to achieve and maintain natural populations, population dynamics, and population distributions in a way that protects Monument resources. The BLM would work cooperatively with the United States Fish and Wildlife Services and Utah Division of Wildlife Resources (UDWR) to fulfill these responsibilities and to meet the requirements of FLPMA, the Endangered Species Act, and other laws and regulations governing fish and wildlife (see also Special Status Species).

LIVESTOCK GRAZING

The Presidential Proclamation establishing the Monument addressed livestock grazing with the following statement: "*Nothing in this proclamation shall be deemed to affect existing permits or leases for, or levels of, livestock grazing on Federal lands within the monument: existing grazing uses shall continue to be governed by applicable laws and regulations other than this proclamation.*"

There is a substantial body of law and regulation governing grazing on public lands. In addition, the Utah State Director for BLM has developed Standards for Rangeland Health and Guidelines for Grazing Management which were approved by the Secretary of Interior on May 20, 1997. The Utah Standards and Guidelines apply to grazing management statewide, including those lands within the Monument (Appendix 7).

This section describes how grazing uses within the Monument shall be managed, in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. It describes a single process for grazing management that does not vary from one plan alternative to another, and provides a single schedule for completion of this process Monument-wide.

It is important to note, however, that applicable regulations[1] also require that grazing be managed in conformance with applicable land use plans, including the approved Monument Management Plan. Ultimately, grazing decisions within the Monument would be formed by applying Federal laws and regulations, all relevant

BLM policy, and the approved Monument Management Plan.

Applicable Statutes and Regulations

The management of grazing on public lands in the United Sates began in 1934 with the passage of the Taylor Grazing Act (TGA), which established a framework for grazing management. This framework was amended in 1976 when Congress enacted FLPMA, which made fundamental changes to the management of public lands overall, including grazing management.

Under FLPMA, public lands are to be managed under the principles of multiple use and sustained yield, unless otherwise specified by law. The Act defines "multiple use" as:

> "...the management of the public lands and their various resource values so that they are utilized in the combination that would best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services...; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historic values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment, with consideration being given to the relative values of the resources and not necessarily to the combination of uses that would give the greatest economic return or the greatest unit output." (Public Law 94-579, Section 103(c)).

FLPMA also established the policy that the public lands are to "be managed in a manner that would protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, would preserve and protect certain public lands in their natural condition; that would provide food and habitat for fish, wildlife, and domestic animals; and that would provide for outdoor recreation, human occupancy, and use."

Under FLPMA, land uses are to be determined through land use planning. As a result, current grazing regulations require that grazing activities and management actions be carried out in conformance with land use plans. The final approved Monument Management Plan would be the land use plan with which all grazing activities and management actions within the Monument must conform.

In addition to complying with the TGA and FLPMA, the BLM must comply with several other laws that affect the range management program. These include the Public Rangelands Improvement Act of 1978, the Wild Free-Roaming Horses and Burros Act of 1971, the Endangered Species Act of 1973, and the National Environmental Policy Act of 1969.

Grazing regulations were first promulgated pursuant to the Taylor Grazing Act. Before 1946, when the BLM was established, the Grazing Service assigned grazing privileges to landowners who historically grazed livestock on public rangelands. This was a complex and contentious process in which use areas, grazing levels, season of use, grazing fees, and base property qualifications were established. In subsequent years, the BLM issued grazing regulations that govern all aspects of the grazing program. This ranged from operator qualifications, term, and conditions for grazing permits, to penalties for unauthorized use. The regulations have been revised from time to time because of new legislation or administrative initiatives. They are found in Volume 43 of the Code of Federal Regulations (CFR), Part 4100.

The BLM Grazing Regulations were most recently revised in August 1995. The revised regulations directed each BLM State Office to develop "Standards and Guidelines for Grazing Administration." A Standard is a minimum resource condition to be achieved on BLM lands, and a Guideline is an acceptable or best management grazing practice that would be applied in order to achieve the Standards. In Utah, the State Director developed the Standards and Guidelines in consultation with the statewide Utah Resource Advisory Council. The Secretary approved the "Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah" on May 20, 1997. Local plans and decisions may be more detailed or stringent than the Utah Standards and Guidelines, but must achieve the Standards and be consistent with the Guidelines.

Grazing Management Process

Within the Monument, the following process would be followed so that grazing management conforms with the Standards and Guidelines issued for public lands within the State of Utah and with the Monument Management Plan. In this process, each grazing allotment would be assessed, and new allotment management plans would be developed, after approval of the Monument Management Plan.

Step 1: Assessment

All allotments would be assessed using one of two methods. Allotments may be assessed using the process described in BLM Instruction Memorandum No. UT 97-73, dated September 5, 1997. Alternatively, allotments may be assessed qualitatively through the interpretation of indicators. The presence, quantity, or distribution of an indicator is an index of ecosystem health. Ecological Reference Areas would be used as benchmarks for qualitative assessments.

Either process includes making an overall assessment of rangeland health, including ecological processes, watershed functioning condition, water quality conditions, and wildlife habitat conditions for each allotment, as described in the Utah Standards for Rangeland Health, in light of the Fundamentals of Rangeland Health at 43 CFR § 4180.1.

Priorities for completing the assessments would be set using the following criteria:

- presence of values that are regulated by operation of law such as water quality, threatened and endangered or sensitive plant and animal species
- areas at high risk of becoming degraded, or high public interest areas
- areas of less concern or public interest

Step 2: Determination of Rangeland Health and Evaluation of Existing Grazing Management

The authorized officer shall determine rangeland health for each allotment according to the Utah Standards and Guidelines for Grazing Administration, in light of the Fundamentals of Rangeland Health. The authorized officer shall determine whether or not assessment results show that each allotment is achieving the Utah Standards and whether or not each allotment is conforming with the Utah Guidelines. If any "Fundamental of Rangeland Health" is not being achieved in any area that is assessed, that area shall be presumed not to be achieving the "Utah Standards for Rangeland Health" (43 CFR . § 4180.1) To the extent any assessment result is found to be inconsistent with any Standard or Guideline, the authorized officer shall determine whether or not existing livestock grazing practices or levels of use are significant factors in such inconsistency. Authorized officers shall take appropriate action under any applicable authorities, including the TGA, FLPMA, the Public Rangelands Improvement Act, and 43 CFR Subparts 4120, 4130, and 4160. This would be done as soon as practicable but not later than the start of the next grazing year, upon determining that existing grazing management needs to be modified to ensure that the Fundamentals of Rangeland Health exist, or if existing grazing management practices or levels of grazing on public lands are significant factors in failing to achieve the Utah Standards and conform with the Utah Guidelines.

Step 3: Develop Allotment Management Plans

The compatibility of grazing with other land uses would be evaluated in allotment management plans (AMP), and the results of the evaluation would be consistent with all applicable legal authorities, including FLPMA, the TGA, the Public Rangelands Improvement Act, 43 CFR Part 4180, Utah Standards and Guidelines, and National Wildlife Federation v. BLM, 140 Interior Board of Land Appeals (IBLA) 85 (1997). Allotment management plans may be developed on an individual basis, or may be developed for a group of allotments where similar ecosystems or land uses exist.

Mandatory Content for AMPs

In addition to all other applicable legal authority, all AMPs shall be prepared in accordance with 43 CFR § 4120.2, and shall ensure that the following conditions exist:

1. Watersheds are in, or are making significant progress toward properly functioning physical condition. This must include their upland, riparian-wetland, and aquatic components. Soil and plant conditions must support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform, and must also maintain or improve water quality, water quantity, and timing and duration of flow.
2. Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow are maintained, or there is significant progress toward their attainment in order to support healthy biotic populations and communities.
3. Water quality complies with State water quality standards, and achieves or is making significant progress toward achieving established BLM management objectives such as meeting wildlife needs.
4. Habitats are, or are making significant progress toward being restored or maintained for Federal threatened and endangered species, Federal candidate species, and other special status species.

Allotment management plans shall designate lands that are available for livestock grazing. Grazing permits or leases shall specify the types and levels of use authorized, including livestock grazing and suspended use.

Regarding conservation use, on September 1, 1998, the U.S. Court of Appeals for the Tenth Circuit decided Public Lands Council v. Babbitt, No. 96-8083 (10th Circuit 1998). The case resolved the Government's appeal of an adverse U.S. District Court order enjoining the application of four separate grazing provisions in 43 CFR Part 4100. The Court of Appeals reversed the District Court's order on three of the four provisions. The only grazing provisions now enjoined are those providing that "conservation use" is a permissible use for a grazing permit. [43 CFR 4100.0-5 (1995) (defining "active use") and 43 CFR 4130.2 (a) (1995) (authorizing permits for conservation use)].

AMPs would include a monitoring program. The monitoring program would be designed to periodically observe and collect data to evaluate the effects of management actions prescribed in the AMP, and to evaluate the effectiveness of those actions in:

- meeting the management objectives stated in the AMP
- achieving the conditions described as the Fundamentals of Rangeland health (43 CFR 4180.1)
- meeting the Utah Standards for Rangeland Health, as indicated by the factors described therein
- ensuring that grazing use is not causing an unacceptable level or pattern of utilization
- ensuring that grazing use is not exceeding livestock carrying capacity

Optional Content for AMPs

- *Grass Bank Allotments/Pastures:*

  The BLM's grazing regulations provide for increasing and decreasing the total number of animal unit months (AUMs) of specified livestock grazing (43 CFR 4110.3-1 and 4110.3-2). The setting aside of lands for future grazing use within the Monument, to offset potential future reductions in existing allotments or to facilitate research in grazing methods, is what the BLM refers to in this document as a grass bank. The BLM may designate grass banks on public lands within the Monument that are not apportioned to any grazing permittee or lessee. Grass banks shall meet the requirements of the Utah Standards and Guidelines in light of the Fundamentals of Rangeland Health, and they shall contain forage that may be apportioned on a sustained yield basis to qualified applicants for livestock grazing consistent with multiple-use management objectives. The BLM may consider making grass bank forage available on an emergency, nonrenewable basis under 43 CFR sec. 4110.3-1(c). Should an allotment or a portion of an allotment become available through a voluntary relinquishment or an operation of law, it would be considered for grass banking.

  The BLM is not obligated to graze the grass bank allotment annually, and use of the grass bank by qualified applicants, permittees, or lessees is within the discretion of the BLM.

- *Science:*

  The geology, soils, and erosional characteristics in the Monument and the resulting plant communities provide opportunities to test, validate, and develop management methods, criteria, or techniques which would lead to improved grazing practices. Similarly, the Monument may present opportunities for testing new partnership arrangements with grazing permittees and interested publics that would lead to improved grazing practices. It would be the policy of the Monument to encourage the use of the special characteristics of the Monument to facilitate such testing or research using scientific methods where appropriate.

Schedule

The 3-step Grazing Management Process described above, and all associated NEPA documents, shall be completed within the 3 years commencing on the first July 1 following the approval of the Monument Management Plan.

MAJOR FACILITIES

Major facilities and the services associated with them would be located outside the Monument in nearby communities. Their precise locations would be based on factors such as the availability of infrastructure, economic considerations including market feasibility and the availability of financing, and managerial concerns. These determinations would be made by the communities or the BLM, as appropriate. The BLM would facilitate these decisions through the proposed Management Advisory Group and by other means.

MANAGEMENT ADVISORY GROUP

A Management Advisory Group (chartered under the Federal Advisory Committee Act) would be established after the plan is completed in order to advise management on a variety of topics.

MANAGEMENT AND EMERGENCY EXCEPTIONS

Limited exceptions to the general management provisions could be granted by the Monument Manager. These exceptions could allow off-highway vehicle use, aircraft landing, motorized or mechanized access on closed routes, or use of mechanized equipment in closed areas. Exceptions would be made in emergencies, or where clearly essential to serve Monument management purposes. Exceptions could be made in cases such as carrying out search and rescue operations, fire prevention and control, and other uses where justified.

In addition, in each of the alternatives, certain authorized users would be given motorized access not given to the general public. This could include giving special access to grazing permittees, Native American Indians, researchers, and others carrying out authorized activities under a permit, right-of-way grant, or other authorization. The special access granted to these permittees would be strictly limited to a specific time period and number of trips, using existing routes where possible, and would only be granted for legitimate and specific purposes.

OUTFITTER AND GUIDE SERVICES

In each alternative, all commercial outfitter and guide services would require a permit. Outfitter and guide services would be subject to limitations on use (allocations) according to the prescriptions of each alternative.

RECREATION

Some aspects of recreation management vary by alternative, while other aspects are common to Alternatives, B, C, D and E. Those aspects that vary are covered in the descriptions of the alternatives. Those aspects that are common to Alternatives B, C, D, and E are as follows. Horses or pack animals would not be allowed in relict plant communities. Sheep species would not be allowed for stock or pack use Monument-wide. Climbing would not be allowed in archaeological sites or on natural bridges or arches; the BLM would work closely with the public to identify climbing areas and develop specific management plans for them. Campfires would not be allowed in the Escalante Canyons and the Paria/Hackberry area, or in archaeological sites, rock shelters or alcoves Monument-wide. As discussed in the transportation section, cross-country travel by vehicle would be prohibited.

RESEARCH AND SCIENCE

The following are fundamental to Alternatives B, C, D, and E. Research and science are at the very heart of the Proclamation which established the Monument. The use of the Monument as an outdoor laboratory for understanding the Colorado Plateau would be emphasized to varying degrees, depending on the alternative, including the study of the history and prehistory of the area. Interdisciplinary and interagency research projects would be encouraged, and research results would be incorporated into management actions. All research proposals would incorporate a public outreach/education component, and when feasible, would include visitors and volunteers in research activities. The BLM would facilitate the transfer of research information to the public.

RIGHTS-OF-WAY

The following criteria apply to the management of all rights-of-way in the Monument where they are allowed:

1. Bury new and reconstructed utility lines unless: visual quality objectives can be met without burying; geologic conditions make burying infeasible; or burying would produce greater long-term site disturbance.
2. All existing and future power lines must meet non-electrocution standards for raptors.
3. All power lines would be constructed using non-reflective wire. Steel towers would be constructed using galvanized steel. Power lines would not be high-lined unless no other location exists.
4. No strobe lights would be allowed at any communication site.
5. Communication site plans would be prepared for all existing sites before any new uses or changes in use occur.
6. A Monument-wide feasibility study would be prepared to determine the most

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appropriate location(s) for new communication sites.

7. Only one access route per subdivision or parcel would be allowed unless public safety warrants alternate escape routes.

In all alternatives, should two proposals (the upgrade of Pacificorp's Cottonwood Canyon power line from 230 kilovolt to 345 kilovolt, and the Lake Powell to Sand Hollow Reservoir water pipeline) be finalized, they would be reviewed for conformance with the management plan. A future analysis and plan amendment may be required.

SOILS

In all alternatives, the BLM would apply procedures to protect soils from accelerated or unnatural erosion in any ground-disturbing activity, including road maintenance and rehabilitation.

SPECIAL MANAGEMENT AREAS

All existing special management designations are consistent with the Proclamation and the objectives of the alternatives in this plan. Thus, these designations would be continued in all alternatives. See Appendix 18 for a full discussion and description of the following areas:

- Calf Creek Recreation Area
- Deer Creek Recreation Site
- Devils Garden Outstanding Natural Area
- Dance Hall Rock Historic Site
- Escalante Canyons Outstanding Natural Area (tracts 2, 3, 4 are included in North Escalante Canyon/The Gulch ISA and Tract 1 and 5 are separate)
- North Escalante Canyon Outstanding Natural Area
- The Gulch Outstanding Natural Area
- Phipps-Death Hollow Outstanding Natural Area
- No Mans Mesa Research Natural Area
- Wolverine Petrified Wood Area

SPECIAL STATUS SPECIES

The BLM would continue to consult with the United States Fish and Wildlife Service to ensure that actions authorized by the BLM do not jeopardize the continued existence of any Federally listed plant or animal species or result in the destruction or adverse modification of critical habitats. In accordance with adopted recovery plans and Section 7(a)(1) of the Endangered Species Act, the BLM would continue to take measures to improve the status of listed plant or animal species and to prevent the need to list other species within the Monument. Likewise, the BLM would ensure that BLM actions do not contribute to the need to list candidate species as threatened or endangered in accordance with BLM Manual 6840. With respect to state animal species of special concern, the BLM would continue to work cooperatively with the UDWR to monitor and protect the species of concern and their habitat within the Monument (see Chapter 3 for information on Fish and Wildlife Service Consultation).

TRANSPORTATION

This plan would designate the route system for the Monument, subject to valid existing rights.[7] Although the BLM had not originally planned to make access decisions in the Monument Management Plan, the agency was persuaded, as a result of widespread requests in the scoping process and further examination, that proper management of the Monument would be enhanced by making decisions on access and transportation routes in the plan. These decisions would be based on what is needed to protect Monument resources, implement the planning decisions, honor valid existing rights, and provide for the transportation needs of surrounding communities. As part of developing an access system for the plan, BLM sought to reach an agreement with Kane and Garfield Counties resolving the many issues surrounding R. S. 2477 rights-of-way and access to the Monument. At the time this Draft Environmental Impact Statement was sent to the printer, negotiations had not reached a conclusion.

The unregulated use of off-highway vehicles (OHV) off designated routes has the potential to damage Monument resources and cause recreation conflicts. Cross-country vehicle travel can damage Monument objects associated with these resources which are sensitive to surface disturbance: archaeology, paleontology, geology, history, cryptobiotic soils, special status plant species, and vegetation. Additionally, OHV tracks can become ruts. These ruts concentrate water flows, altering water quality and quantity and creating erosion. Some wildlife and special status wildlife species are sensitive to the presence of OHVs and may leave calving and fawning areas, roosts and nests, or other critical habitat. Likewise, OHVs conflict with primitive recreation experiences by introducing the sights and sounds of civilization. Therefore, in Alternatives B, C, D and E, cross-country motorized and mechanized travel would be prohibited. Use on designated routes is provided for in Alternatives B, C, D and E. Alternative A, the No Action Alternative, continues the existing cross-country use along with OHV closures.

VALID EXISTING RIGHTS AND OTHER EXISTING AUTHORIZATIONS

The Proclamation establishing the Monument states: "The establishment of this monument is subject to valid existing rights." This sentence reflects the President's intention to honor rights that existed prior to the establishment of the Monument. Before it was established, the lands within Grand Staircase-Escalante National Monument were subject to various authorizations, some giving "rights" to the holders and some of which could be construed as providing valid, but lesser, interests.

Valid existing rights (VERs) are those rights in existence within the boundaries of Grand Staircase-Escalante National Monument before the Monument was established on September 18, 1996. Valid existing rights were established by various laws, leases, and filings made with the BLM. This section describes such VERs within the Monument, addresses how VERs would be verified, and explains how applications and notices filed after completion of the plan on existing mining claims would be addressed. Also addressed are the lesser interests or other authorizations that existed prior to the Proclamation; a discussion of how those authorizations would be handled subsequent to adoption of this plan is also included.

Energy and Mineral Activities (Including Hardrock, Oil, Gas & Coal)

The Proclamation establishing the Monument withdrew all Federal lands and interests in lands within the Monument from entry, location, selection, sale, leasing, or other disposition (except for exchanges that further the protective purposes of the Monument) under the public land laws, including the mineral leasing and mining laws. Thus, no new Federal mineral leases or prospecting permits may be issued, nor may new mining claims be located within the Monument. Authorization for activities on existing mineral leases and mining claims, according to the Proclamation, would be governed by VERs.

With respect to oil and gas leases, mineral leases, and mining claims "valid existing rights" vary from case to case, but generally involve rights to explore, develop, and produce within the constraints of laws and regulations.

The laws, regulations, and standards related to Mineral Activities include, but are not limited to:

- **The Mining Law of 1872** (30 U.S.C. 22 *et seq.*), as amended, and Federal regulations 43 CFR 3802 and 3809. Under the Mining Law of 1872, individuals are permitted to enter open Federal public lands to explore for "hardrock" mineral deposits such as gold, silver, copper, etc., stake mining claims, and upon discovery of a valuable mineral deposit, obtain rights to the mineral. The Monument is no longer open to the location of new mining claims under the 1872 mining law. Regulation 43 CFR 3802 and 3809 are regulations that implement FLPMA's mandate to prevent unnecessary or undue degradation from surface disturbing activities due to mining operations conducted under the Mining Law of 1872. Regulation 43 CFR 3802 applies only to Wilderness Study Areas (WSAs), including WSAs in the Monument.

- **The Mineral Leasing Act of 1920** (30 U.S.C.181 *et seq.*), as amended, and associated regulations (43 CFR 3100-3500). This act made certain minerals leasable and therefore not open to acquisition by locating mining claims. The Mineral Leasing Act and associated regulations provide the legal and regulatory framework for issuing prospecting permits and mineral leases. These regulations apply to the exploration and development of oil, gas, phosphate, gilsonite, tar sands, and other leasable minerals on public lands. However, the Monument is no longer subject to the issuance of new prospecting permits or mineral leases.

  Stipulations are attached to permits and leases to mitigate impacts to sensitive resources (see below). These rules also address coal leasing. Coal permitting and reclamation standards are addressed in the next paragraph.

- For coal, the **Surface Mining Control and Reclamation** Act of 1977, as amended, (30 U.S.C. 1201 *et seq*), and implementing rules at 30 CFR 700 to the end. Regulation 30 CFR, parts 740 and 944, establishes the standards relating to coal mining in Utah, and 30 CFR 944.30 contains the cooperative agreement governing the development of coal underlying Federal lands in Utah. For the most part, the State of Utah regulates permitting and reclamation standards for coal mining within Utah, and consults and coordinates with the BLM and other Federal land management agencies.

- **Federal Land Policy and Management Act, Section 302(b).**
  Under section 302(b) of FLPMA, operations cannot be allowed to cause unnecessary or undue degradation of the public lands.

- **Standard Lease Terms contained in Form 3100-11, "Offer to Lease and Lease for Oil and Gas" and in 43 CFR 3101.** The Standard Lease Terms state that a lease grants the exclusive right to drill for, mine, extract, remove, and dispose of oil and gas deposits located on leased lands. Operations must be conducted in a manner that minimizes adverse impacts to the land, air, water, cultural, biological, and visual elements of the environment, as well as other land uses or users. Federal environmental protection laws such as the Clean Water Act, the Endangered Species Act, and the Historic Preservation Act are applied to all lands. Standard lease terms provide for reasonable measures to minimize adverse impacts to surface resources. These include, but are not limited to, modifications to the siting or design of facilities, timing of operations, and specifications of interim and final reclamation measures.

  The Standard Lease Terms can be modified by special or supplemental stipulations attached to the lease (43 CFR 3101). In addition, conditions of approval can be developed on specific site applications to meet other resource concerns

For convenience of analysis, this section treats existing mining claims as having valid existing rights. The BLM has not, however, determined that any of these mining claims are valid, and all or some may eventually be determined invalid. Mining claims determined invalid would not be developed subsequent to that determination.

Within the Monument, there are currently 71 mining claims covering approximately 2800 acres, 85 oil and gas leases encompassing more than 136,000 acres, and 17 coal leases on approximately 54, 000 acres (see Chapter 3 for more details on existing leases and mining claims).

The BLM would verify whether valid existing rights are present in each of these cases by periodically reviewing the files related to existing mining claims and leases. This would help ensure that required actions, filings, and fees are in full compliance with the law. This process, known as adjudication, would continue for the life of each valid existing right. In addition, VERs may be examined in the field for compliance with laws and regulations. For example, the BLM can investigate at any time whether mining claims within the Monument have a discovery of a valuable mineral deposit, as required by the 1872 Mining Law (as amended). In addition, the BLM would continue to monitor oil and gas activities through its Inspection Program.

Once a VER is verified, the process used to address applications or notices filed under that VER (such as an application to drill on an oil or gas lease, or a plan of operations or notice filed on a mining claim) after the completion of the plan would vary by commodity and regulation. However, for all applications and notices, the BLM would use a documented analysis (NEPA or other written documentation) to determine potential impacts on the Monument resources that the plan is required to protect. Once such analysis is completed, the BLM would take the following actions on a case by case basis:

1. If the analysis indicates no impact to Monument resources, or indicates impacts to resources, but determines that the impacts are consistent with the Proclamation, the proposed operation can proceed in accordance with regulations, standards and stipulations.
2. If analysis and documentation indicate that, under the laws, regulations, and stipulations discussed above, a proposal may have impacts that are not in conformance with the Proclamation and Monument resources, the BLM would take the following actions on a case by case basis:
    - A. Work with the applicant to find alternatives or modifications to the proposal that would either:
        1. Cause no adverse impacts to Monument resources, or
        2. Minimize such impacts through special stipulations or other permit conditions.
    - B. Disapprove the proposal if "A"(above) fails and such disapproval is consistent with the applicant's rights.
    - C. Initiate a validity examination process for mining claims and mill sites while monitoring operations to prevent unnecessary or undue degradation. In the case of a notice properly submitted on a mining claim under 43 CFR 3809, if negotiations in "A" (above) fail, the validity examination would result in a determination by the BLM as to whether a discovery of a valuable mineral deposit has been made by the date of creation of the Monument. This is a requirement for valid existing rights. If criteria for a temporary restraining order and injunction were met, seek such judicial relief from start-up of operations while the validity determination and any related appeals are in process.

Other Existing Rights or Interests

There are other situations, unrelated to minerals, in which the BLM has authorized some use of public land, or has conveyed some limited interest in public land. The authorization may be "valid", "existing", and may convey some "right" or interest. Many rights-of-way[3], easements[4], and leases[5] granted on public land are in this category. They vary from case to case, but the details of each one are specified in the authorizing document. Some authorizations for these activities in the Monument include:

- FLPMA Section 302 (43 U.S.C. 1732) and 43 CFR 2900 (for leases and permits)
- FLPMA Title V (43 U.S.C. 1761-1771) and 43 CFR 2800 (for rights-of-way, excluding oil and gas pipelines)
- The Mineral Leasing Act, Section 28(30 U.S.C. 185) and 43 CFR 2800 (for oil and gas pipeline rights-of-way)
- The Recreation and Public Purposes Act (43 U.S.C. 869 et seq.) and 43 CFR 2740 (for recreation and public purposes leases to State and local governments and to qualified nonprofit organizations)

These authorizations, where they are valid and existed when the Monument was established, would be recognized in the Monument and their uses would be allowed subject to the terms and conditions of the authorizing document. However, where these uses conflict with the protection of Monument resources, and where legally possible, leases, permits, or easements would be adjusted to eliminate or minimize adverse impacts.

With respect to rights-of-way, easements, and leases, there are currently 106 rights-of-way authorized under FLPMA and the Mineral Leasing Act, and 2 leases (encompassing 17.5 acres) issued under the Recreation and Public Purposes Act (see Chapter 3 for more detail on existing rights-of-way and other authorizations).

In addition to the authorizations above, there are 17 authorized mineral material sites in the Monument where the removal of construction-type minerals such as sand and gravel had been allowed. Seven of the mineral material sites were authorized under the Materials Act of 1947 (30 U.S.C. 601 *et seq.*), as amended, and were subject to either free use permits or contracts of sale. The Materials Act of 1947 specifically excludes the disposal of mineral materials from National Monuments. As a result, free use permits or contracts for mineral materials authorized under this Act would not be renewed.

The remaining ten sites are authorized under Title 23 U.S.C. Section 107 (1998), which provide for the appropriation of lands or interests in lands for highway purposes (see Chapter 3 for more detail on existing mineral material sites and Title 23 sites). Unlike free use permits or contracts for sale of mineral materials that are issued for a fixed term, Title 23 rights-of-way continue without a fixed term. The BLM does not resume jurisdiction over the land covered by the rights-of-way until the lands are returned to BLM upon a determination by the Federal Highway Administration that the need for the material no longer exists. Existing Title 23 rights-of-way within the Monument are inconsistent with the protection of Monument resources. The BLM would request closure of these sites from the Federal Highway Administration and would work with the Federal Highway Administration to find suitable replacement sources of mineral material.

There are also numerous private lands and Utah School and Institutional Trust Lands within the boundaries of the Monument. They are not Monument lands, but their presence has implications for Monument lands, because landowners generally have rights to reasonable access to their lands across public lands. The Proclamation does nothing to alter that.

Owners of non-Federal land surrounded by public land managed under FLPMA are entitled to reasonable access to their land. Reasonable access is defined as access that the Secretary deems adequate to secure the owner reasonable use and enjoyment of the non-Federal land. Such access is subject to rules and regulations governing the administration of public land." In determining reasonable access, the BLM has discretion to evaluate and would consider such things as proposed construction methods and location, reasonable alternatives, and reasonable terms and conditions as are necessary to protect the public interest and Monument resources.

There are currently about 175,000 acres of surface rights and 200,000 acres of mineral rights managed by the Utah School Institutional and Trust Lands Administration (SITLA) within the Monument boundary. In addition, about 15,000 acres of land within the Monument boundary are privately owned.

Under the May 8, 1998 agreement signed by U.S. Interior Secretary Babbitt and Utah Governor Leavitt (awaiting enactment of ratifying legislation), the United States would acquire SITLA lands within the Monument. The State inholdings within the Monument that would be transferred to the United States upon implementation of the agreement contain numerous interests of varying types (e.g., leases, permits, licenses) held by third persons.

The agreement provides express assurances that the United States would accept the transferred lands subject to valid existing rights, found acceptable under the Attorney General's title regulations. Specifically, section 6 makes clear that nothing contained in the Agreement would impair valid existing water rights owned by private parties. All terms and conditions of existing State grazing permits would be honored. Moreover, ranchers who rely on the State section to meet Federal base property requirements for Federal grazing permits would be able to continue to use the former State section to qualify as base property. The agreement also includes a provision ensuring that nothing expands or diminishes pre-existing rights-of-way under State or Federal law. Finally, mineral leases would remain in force and subject to their existing terms.

Other Land Use Authorizations

There are a variety of other land use authorizations which were in effect at the time of the Proclamation, and which, although they involve no "rights," are being continued in the Monument. Outfitter and guide permits are a case in point. These permits authorize certain uses of public land for a specified time, under certain conditions, without conveying a right, title, or interest in the land or resources used. Such permits would be recognized in the Monument and fulfilled subject to the terms and conditions of the authorizing document. If at any time it is determined that an outfitter and guide permit, other such permit, or any activities under those permits, are not consistent with the Monument Management Plan, then the authorization would be adjusted, mitigated, or revoked where legally possible.

Grazing permits are also in this category. Grazing permits or leases convey no right, title, or interest in the land or resources used. Although the Proclamation specifically mentions livestock grazing, it does not establish it as a "right" or convey it any new status. The Proclamation states that "grazing shall continue to be governed by applicable laws and regulations other than this proclamation," and says that the Proclamation is not to affect existing permits for, or levels of, livestock grazing within the Monument. Other applicable laws and regulations govern changes to existing grazing permits and levels of livestock grazing in the Monument, just as in other BLM livestock grazing administration programs. Management of livestock grazing is addressed previously in this "Management Common to All Alternatives" section.

VEGETATION

Management Objectives

Under each alternative, the Monument would be managed to achieve a natural range of native plant associations. Management activities would not be allowed to significantly shift the makeup of those associations, disrupt their normal population dynamics, or disrupt the normal progression of these associations.

Vegetation Manipulation and Weed Control

Vegetation manipulation could be used to achieve the management objectives listed above, within the constraints of the alternative selected. Chaining and aerial chemical spraying would not be used within the Monument. The objective of the weed control program is to remove noxious weeds and restore native plant associations.

Forestry Products

Fuelwood (green or dead and down) harvesting , post cutting, and Christmas tree cutting are by permit only and within designated areas. Actual cutting areas would be determined under the permit system. Off-highway vehicle restrictions would apply. Vehicular travel would be allowed only on designated routes.

No commercial timber harvesting is authorized within the Monument. Commercial fuelwood cutting would be limited and authorized in designated areas only to accomplish resource management objectives.

Non-Native Plants

Under all alternatives, native plants would be used as a priority. However, non-native plants may be used to protect Monument resources, to the extent that use complies with the "Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah" (1997) (Appendix 7). Non-native plants would be used judiciously for restoration related research and in emergency situations, if the use is consistent with and furthers the objectives of the applicable management zone. Non-native plants could not be used to increase forage for livestock.

VENDING

Vending within the Monument would be occasional, infrequent, and allowed by permit on a case-by-case basis. Generally, permits could be issued to provide services needed at recreation sites (such as fuelwood sales at campgrounds) and services that are commonly offered in conjunction with competitive and special events. The BLM would work with Utah Department of Transportation to regulate vendors along Highways 12 and 89. Criteria to protect Monument resources would be included in all permits.

VISUAL RESOURCE MANAGEMENT

An inventory of visual resources, using the procedures specified in BLM's Visual Resource Inventory Manual H-8410-1, was updated for the Monument. Utilizing the results of the Visual Resource Inventory and other resource allocation considerations, lands in the Monument are assigned to one of four Visual Resource Management (VRM) Class objectives. The VRM Class objectives would be assigned as follows:

VRM Class II - 1,275,900 acres
VRM Class III - 561,300 acres
VRM Class IV - 35, 300 acres

All proposed actions resulting in surface disturbance must consider the importance of the visual values and the impacts the project may have on these values. While performing an environmental analysis for projects, the visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of the proposal. Projects would be designed to mitigate impacts and conform to the assigned VRM Class objective. Refer to Chapter 3, Map 3.4, and Appendix 8 for a description of VRM classes and objectives.

VRM classes acknowledge existing visual contrasts. Existing facilities or visual contrasts would be brought into VRM class conformance to the extent practicable when the need or opportunity arises (i.e. rights-of-way renewals, mineral material site closures, abandoned mine rehabilitation, etc.).

Areas that are designated wilderness or designated a wild section of a National Wild and Scenic River in the Monument would be reassigned to Class I VRM Class objectives at the time the law creating wilderness or National Wild and Scenic River becomes effective.

WATER: ASSURING AVAILABILITY

The Proclamation establishing the Monument directs the Secretary "to address in the management plan the extent to which water is necessary for the proper care and management of the objects of this monument and the extent to which further action may be necessary pursuant to Federal or State law to assure the availability of water."

The importance of water for the proper care and management of Monument resources is discussed in Chapter 3. This section examines options under Federal and State law for assuring the availability of such water.

The water necessary for the proper care and management of Monument resources falls into two general categories: (1) water needed for Monument facilities to accommodate researchers and other visitors; (for campgrounds, sanitary facilities, and administrative purposes), and (2) water needed for the protection of the historic and scientific objects of the Monument and the natural processes associated with them.

For several reasons, it is the water in the second category that is most challenging to identify, quantify, and protect. Water in this category is referred to generally as "instream flows," and simply means allowing water as it naturally occurs in streams, seeps, springs, and other expressions of groundwater, and even precipitation, as one of the forces of nature, to continue to operate. The legal system of water law and water rights administration does not fully address that task. Precipitation generally becomes subject to the water law system only once it reaches a watercourse (typically defined as a stream or channel with an identifiable bed and banks), a groundwater aquifer, or is otherwise captured or contained in such a way that it can be used to satisfy established water rights. Furthermore, high volume flood flows generally are not appropriated and reduced to a water right, unless there is an impoundment or similar mechanism in place to capture and store these high flows for later use. Finally, while it is possible to perfect water rights in instream flows for non-consumptive, ecological and related uses, certain limitations on that method exist, as explained below.

Water flows in the Monument are already or can be protected in most instances by means other than formal water rights of any kind. Specifically, nearly all of the land within the Monument is Federally owned, and the BLM has broad powers over how those lands are used. BLM can exercise its land management authorities to protect water flows by simply not allowing construction of storage, diversion, or conveyance facilities on these lands, and in many situations this can be as effective in protecting Monument resources as securing formal rights to such flows.

The approval of a water appropriation application by the Utah State Engineer does not create a water right, only the right to try to place the water to beneficial use and thereby establish a water right. If the proposed point of diversion is on land not owned by the applicant, land use permission is a necessary element of placing the water to legal beneficial use. The State Engineer commonly makes this point in approving appropriation applications. In one such recent instance, he said, "Also this approval in no way grants right of trespass. Such rights-of-way are the responsibility of the applicant to obtain from the appropriate party." (Memorandum Decision, In the Matter of Change Application Number 97-6 (a21081), August 6, 1998)

Where the proposed point of diversion is on Federal land, the land managing agency can decide whether to allow the diversion and any related conveyance structures to be located on its land. Particularly where BLM (along with other Federal agencies managing adjacent Federal land) manages the upper reaches or headwaters of water courses, it can (subject to valid existing rights, including water rights) effectively prevent others from coming onto Federal land to construct facilities and establish new water rights that might interfere with the water needs of Monument resources. The only limitation on this type of protection is the possibility of groundwater drainage within the Monument (possibly adversely affecting flows in a spring covered by BLM water right, for example) as a result of groundwater pumping from wells located outside the Monument.

Protecting water and water-dependent resources through land management means is less effective in situations where watercourses found in the Monument arise outside the Monument and flow into it, or in situations where there are private inholdings within the Monument. In these situations, absent an instream flow right, BLM generally cannot exercise its land management authority to protect those water resources from diversion on non-Federal land, even if such diversions may interfere with Monument resources. This is also true, to some extent, where a BLM boundary crosses a groundwater aquifer, i.e., where part of an aquifer lies beneath Monument land and part underlies non-Monument land. This can also occur where aquifers outside the Monument feed streams that flow into the Monument. It is questionable whether BLM has any authority to prevent the pumping of groundwater from such aquifers, (absent an instream flow water right) even though such pumping might interfere with water necessary for the protection of Monument resources.

With the above as background, the following discusses further actions for assuring the availability of water.

Appropriative Water Rights under State Law

BLM may obtain appropriative water rights under Utah State law where BLM meets State law requirements. Campground, visitor, sanitary, and other administrative uses are clearly "beneficial uses of water" under State law, for which water rights may be granted by the Utah State Engineer. Furthermore, none of the four administrative basins established by the Utah State Engineer has yet been closed to new appropriations due to being considered fully appropriated. Utah law also allows the United States and BLM, as the land owner/managing entity, to obtain such water rights in its own name, rather than the actual users (i.e., the visitors). It is entirely reasonable to seek to obtain and perfect water rights for such visitor and administrative purposes under Utah law.

Instream flows are another matter. Under Utah law the only entities authorized to hold instream flow rights are the UDWR and the Utah Division of Parks and Recreation, and these entities have severe restrictions imposed on them in obtaining and holding such water rights. State law precludes these agencies from appropriating unappropriated water for instream flow rights. They must find a willing seller, buy the water right, and submit a change application thereon to the Utah State Engineer. They may not condemn a water right for these purposes, and are precluded from using general agency funds for such acquisitions; they may only use funds specifically appropriated for such purposes by the State legislature, although they may accept a donated water right (U.C. 73-3-3). It may be possible to work out a cooperative agreement between BLM and one of the state agencies authorized to acquire and hold an instream flow right, where the state agency has a similar interest in protecting a particular resource, such as a state-listed sensitive species of fish or wildlife. It is doubtful, or at least not clear at this point, whether all of the water resources needed for the proper care and management of the Monument resources could be handled this way. We invite comment on this approach and are beginning discussions with the state agencies toward this end.

Another State law option relies on Utah's version of the public interest doctrine. Under this doctrine, the Utah State Engineer has authority to deny a water right application, even if there is unappropriated water available, if he is convinced that the water would serve a more beneficial purpose by remaining in the channel. Bonham v. Morgan, 788 P.2d 497 (Utah 1989). This authority stems from the provisions of U.C. 73-3-1 and 73-3-8. The relevant portion of U.C. 73-3-8 reads as follows:

> If the Utah State Engineer, because of information in his possession obtained either by his own investigation or otherwise, has reason to believe that an application to appropriate water would interfere with its more beneficial use for irrigation, domestic or culinary, stock watering, power or mining development or manufacturing, *or would unreasonably affect public recreation or the natural stream environment, or would prove detrimental to the public welfare,* it is his duty to withhold his approval or rejection of the application until he has investigated the matter. If an application does not meet the requirements of this section, it shall be rejected. (Emphasis added.)

The Utah State Engineer has, on occasion, implemented this authority by use of a formal, declared policy statement, as he did to prevent appropriation or use of endangered fish protection flows released from Flaming Gorge Reservoir, as part of the recovery plan for the endangered Colorado River native fishes.

BLM in appropriate circumstances can approach the Utah State Engineer with a request to use this authority to protect natural flows in the Monument in a similar manner.

An additional means of seeking to protect Monument resources dependent on water is to purchase private water rights either inside or outside the Monument if it is demonstrated that the effect of the current use of the water right is adversely affecting Monument resources. Such acquisition must, under existing law, be on a willing seller basis.

Federal Reserved Water Rights

The Grand Staircase-Escalante National Monument Proclamation does not reserve water as a matter of Federal law. It does not, however, abolish or defeat BLM's claims to Federal-law-based water rights under other reservations or proclamations. These are discussed below.

- Wild and Scenic Rivers

The BLM planning process provides for public nominations of river segments which may be eligible for inclusion in the National Wild and Scenic River System. To be considered, the body of water must be free-flowing and contain outstandingly remarkable values related in some way to the stream. These values are: scenic, recreational, geologic, fish and wildlife, cultural, historic, hydrologic, ecological and biological diversity, paleontological, botanic or scientific study.

The nomination of a river through the planning process by itself creates no Federal reserved water right. BLM has no authority of its own to designate a wild and scenic river and thereby create such rights. Only the Congress, or the Secretary of the Interior upon application of the Utah Governor, may designate a Wild and Scenic River within the Monument. Such a designation would, under established legal doctrine, reserve sufficient water to carry out the purposes of the designation, including instream flows.

- **Public Water Reserves**

The Pickett Act of 1910 (repealed in 1976) vested the President with authority to withdraw and reserve certain public lands for public purposes (Act of June 25, 1910, ch. 421, 36 Stat. 847, as amended). Those purposes included preserving water resources on the public lands to serve the traveling public, including livestock. In 1913, the President issued Order of Withdrawal, Public Water Reserve No. 10, Utah No. 5 ("1913 Order") so that "the right to the use of the water, and consequently of the adjacent range, may remain in the public." The 1913 Order reserves for public use certain tracts in the State of Utah, some within the Monument, most consisting of all the land within one quarter mile of a designated water source.

In a subsequent withdrawal order in 1926, Public Water Reserve No. 107, the President made a blanket reservation of (1) every smallest legal subdivision of vacant, unappropriated, and unreserved public land containing a spring or water hole, and (2) all land within one quarter mile of a spring or water hole on unsurveyed public land for public use and "in aid of pending legislation." The pending legislation referred to is indicated in the referral letters as "the pending bill to authorize the leasing of grazing lands upon the unreserved public domain." In 1983, the Utah State Office of the BLM determined which lands "contain important spring or water holes of sufficient size and value to the public to have created a withdrawal" under the 1926 Order (Memorandum, from Chief, Branch of Lands and Minerals Operations to State Director, Utah, Bureau of Land Management, Feb. 4, 1983). Many are in the Monument.

Courts have held that public water reserves do create Federal reserved water rights [see, e.g., U.S. v. Denver, 656 P. 2d1 (S. Ct. Col. 1982) and U.S. v. Idaho, No. 23587 (S. Ct. Ida., April 6, 1998)], but these courts generally regard these water rights as limited to human and animal consumption. The water reserved under Federal law by these reservation may contribute to the care and management of Monument resources, but may not be entirely sufficient for that purpose. Used in conjunction with appropriate land management decisions, however, they may be helpful.

- Congressional Reservation of Unappropriated Water

Congress may expressly reserve any unappropriated water within the Monument necessary to preserve Monument resources. Such a reservation would be subject to valid existing rights and would have a very junior priority date; the date of the reservation of the water, not of the Monument itself. This means, in effect, that the Monument would continue to be subject to all water rights on the system senior to its own water right, but would at least be protected from adverse effects arising from subsequent appropriations.

- Presidential Proclamation

A reserved water right may be created by Presidential Proclamation under the Antiquities Act [Cappaert v. United States, 426 U.S. 128, (1976)]. If Monument needs for water cannot be met by other means, the President could amend the original proclamation specifically to include water for the purposes now identified by BLM as necessary to protect Monument resources.

Strategy for Assuring Water Availability

As the above discussion demonstrates, water is important to a number of Monument resources, and its continued availability is necessary for their proper care and management. Our review to date strongly suggests, however, that both currently and into the reasonably foreseeable future, water would continue to be available for these purposes. This is for several reasons. First, much of the water important to the Monument falls as precipitation within the Monument or on adjacent Federal lands, and is not subject to appropriation by others. Its continued availability for Monument resources can be safeguarded by appropriate Federal land management policies. Second, in those relatively few places where opportunities exist for appropriation under state law upstream from, or on private inholdings within, the Monument, both current and reasonably foreseeable appropriations do not in general significantly threaten the continued availability of water in the Monument. Third, current State law and policy limits new appropriations in these areas, as discussed above. Fourth, Federal law may already provide some protection, as discussed above.

For all these reasons, we believe a sound strategy for assuring the continued availability of water for Monument resources is as follows: (1) ensure that land management policies are sensitive to water issues, and (2) initiate discussions with the Utah State Engineer. These discussions could explore such things as developing more information about water uses and needs in the area (developing water budgets and forecasts of future needs), examining opportunities for securing under state law instream flow protection for Monument resources, making sure that state policies on new appropriations in the area are sensitive to Monument needs, and exploring whether other steps ought to be taken to protect Monument resources against the possibility of future upstream development that may threaten them. For example, BLM, the State and communities adjacent to the Monument could engage in joint studies on such issues. One goal could be to identify how nearby communities could secure water supplies for expected future growth without interfering with the water flows needed for Monument resources. An agreement recently reached between the Department of the Interior (on behalf of Zion National Park), the State, and local water users suggests a useful mode. The agreement allows additional future non-Federal development of water that could affect the Park, but caps it, and protects the continuation of "spike" or flood flows through the Park resulting from extraordinary precipitation events, to protect the important role of such events in the Park environment.

We invite comment on these preliminary conclusions and suggestions for proceeding.

WILDERNESS STUDY AREAS

Wilderness preservation is part of BLM's mandate. Pursuant to this mandate, certain areas within the Monument have been identified for wilderness review. The purpose of these areas, referred to as Wilderness Study Areas (WSAs), is to protect potential wilderness values until further study is completed, recommendations on their suitability for wilderness designation are made, and legislation takes effect to designate them as part of the National Wilderness Preservation System or release them from further study or protection.

The Monument contains 16 WSAs, totaling approximately 880,600 acres, or about 52 percent of the BLM acres in the Monument (Appendix 9). These WSAs were identified in a 1978-80 inventory as having wilderness character and thus worthy of further study to determine their suitability for designation as part of the National Wilderness Preservation System. In 1990, the Utah Statewide Final Environmental Impact Statement analyzed the suitability of the WSAs for designation, and in 1991, the Utah Statewide Wilderness Study Report made suitability recommendations to Congress. Further recommendations on wilderness suitability are outside the scope of this plan.

Existing WSAs in the Monument would be managed under the BLM's Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM Manual H-8550-1) until legislation takes effect to change its status. The major objective of the IMP is to manage lands under wilderness review in a manner that does not impair their suitability for designation as wilderness. In general, the only activities permissible under the IMP are temporary uses that create no new surface disturbance nor involve permanent placement of structures. Temporary, non-disturbing activities, as well as activities governed by valid existing rights, may generally continue in WSAs.

Actions allowed under the IMP would also be subject to other BLM laws and policies that govern the use of public land, including management prescriptions or other restrictions developed in this Monument Management Plan (where they are consistent with the IMP). It is important to note that some uses and activities described in the management alternatives in this plan may not be achievable under the IMP. Where these conflicts occur, IMP would take precedence until action is taken by Congress to either designate them or release them from further protection. This plan is intended to apply to any and all lands within the Monument if Congress releases them from WSA status.

WILDFIRE SUPPRESSION

Under the current Fire Management Plan, wildfire would be managed to protect life, property, and resources, and to maintain or improve ecosystem health. These goals would determine the kind of response that would be made to each fire. In areas with developments, such as campgrounds, full fire suppression would be used with appropriate buffers. The use of heavy equipment or off-highway travel would be prohibited, except when permitted by the Monument Manager. Wilderness Study Areas, prehistoric and historic wood structures and their components (such as beams in prehistoric sites), as well as rock art, would be protected, but the least disturbing minimum suppression tools or methods would be used. Response to wildfire would be from the closest fire suppression entity, regardless of agency. Fire plans and suppression agreements are updated annually. Current plans would be updated based upon the decisions made in this Monument Management Plan, and as needed to protect Monument resources.

WITHDRAWAL REVIEW

The Proclamation establishing the Monument states: "All Federal lands and interests in lands within the boundaries of this Monument are hereby appropriated and withdrawn from entry, location, selection, sale, leasing, or other disposition under the public land laws,.... The Proclamation also states: "Nothing in this Proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation: however, the National Monument shall be the dominant reservation." This statement refers to any lands within the Monument that have been removed or withdrawn from operation under some or all of the public land laws (such as mining and/or mineral leasing laws) by statute or Secretarial order prior to the Proclamation. These withdrawals were imposed to achieve a variety of purposes, and they remain in effect until specifically revoked, or otherwise expire. Many were established prior to the enactment of FLPMA in 1976. These withdrawals are listed in Table 3.9 in Chapter 3.

In all alternatives, the BLM would continue to review withdrawals within the Monument to determine their consistency with the intent of the withdrawal. Any withdrawals no longer meeting their intended purpose would be revoked under section 204 of FLPMA. Where appropriate, existing withdrawals could also be modified or revoked to implement the objectives of this plan.

END NOTES

1. 43 CFR Ch II 4100.0-8, Grazing Administration, General: Land Use Plans.
"...Livestock grazing activities and management actions approved by the authorized officer shall be in conformance with the land use plans as defined at 43 CFR 1601.0-5(b)."

43 CFR 1601.0-5(b): "*Conformity* or *conformance* means that a resource management action shall be specifically provided for in the plan, or if not specifically mentioned, shall be clearly consistent with the terms, conditions, and decisions of the approved plan or plan amendment."

2. Some government entities may have a valid existing right to an access route under Revised Statutes (R.S.) 2477, Act of June 26, 1866, ch. 262, § 8, 14 Stat. 251 (codified as amended at 43 U.S.C. § 932 until repealed in 1976 by the Federal Land Policy and Management Act of 1976 (FLPMA), Public Law 94-579, Section 706(a), Stat. 2744, 2793 (1976), which granted "[t]he right-of-way for the construction of highways over public lands, not reserved for public uses." As described in the United States Department of Interior, Report to Congress on R.S. 2477 (June 1993), claims of rights-of-ways under R.S. 2477 are contentious and complicated issues, which have resulted in extensive litigation. See E.G, Sierra Club v. Hodel, 848 F.2d 1068 (10th Cir. 1988); Southern Utah Wilderness Alliance v. Bureau of Land Management, Consolidated Case No. 2:96-CV-836-S (D. Utah, filed Oct. 3, 1996, pending). It is unknown whether any R.S. 2477 claims would be asserted in the Monument which are inconsistent with the transportation decisions made in the Final Plan or whether any of those R.S. 2477 claims would be determined to be valid. To the extent inconsistent claims are made, determinations of the validity of those claims would have to be determined. If claims are determined to be valid R.S. 2477 highways, the Final Plan would respect those as valid existing rights. Otherwise, the transportation system described in the Final Plan would be the one administered in the Monument.

3. A "right-of-way" refers to the public lands authorized to be used or occupied pursuant to a right-of-way grant. A right-of-way grant authorizes the use of a right-of-way over, upon, under or through public land for construction, operation, maintenance and termination of a project (from 43 U.S.C. Section 1761-1771, 43 CFR Ch. II, 2800.0-5).

4. An easement is a non-possessory, non-exclusive, interest in land which specifies the rights of the holder and the obligation of the Bureau of Land Management to use and manage the lands in a manner consistent with the terms of the easement. (from 43 U.S.C. 1732, 1733, 1740, 43 CFR 2920.0-5)

5. A lease is an authorization to possess and use public land for a fixed period of time. (from 43 CFR 2920.0-5)

6. Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 3210). The courts have found that this provision applies nationally. Also found in BLM Manual 2800.06B.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

During public scoping for the Monument Management Plan in 1997, some participants proposed alternatives that would emphasize extremes in management for the Monument, such as total preservation or full development of all resources. However, the majority of those who participated indicated that analysis of such alternatives would be misleading, and would create misunderstanding among the public, because such alternatives could not be implemented consistent with the Proclamation.

The Council on Environmental Quality guidelines for implementation of NEPA require Federal agencies to analyze all "reasonable" alternatives that substantially meet the purpose and need for the proposed action. The purpose of the Monument Management Plan is to provide for management of Grand Staircase-Escalante National Monument within the provisions of the Proclamation, and to meet the requirements of FLPMA and other laws and regulations. Because the Proclamation states that certain uses will not continue, and that other uses will continue consistent with Federal laws and regulations, alternatives that do not comply with the Proclamation would not meet the purpose and need for the plan, and are therefore not analyzed further in this EIS. Specific alternatives that were suggested but are not analyzed include:

NO LIVESTOCK GRAZING

The BLM has the responsibility to manage livestock grazing in the Monument as directed in the Proclamation, which states: "Nothing in this proclamation shall be deemed to affect existing permits or leases for, or levels of, livestock grazing on Federal lands within the monument; existing grazing uses shall continue to be governed by applicable laws and regulations other than this proclamation."

Because the designation of the Monument cannot affect permits for, or levels of, livestock grazing, elimination of livestock grazing is not a reasonable alternative for further analysis. A discussion of livestock grazing objectives is found in this chapter, in Management Common To All Alternatives.

FULL RECREATION DEVELOPMENT

The Proclamation gives foremost regard to the scientific and historic objects of the Monument. Visitor use must be secondary to the protection of Monument resources under the Antiquities Act mandate to protect objects of historic and scientific value. While Alternative E emphasizes opportunities for visitors, it does so while complying with the goal of protecting Monument resources. Emphasizing recreation over protection of Monument resources is not a reasonable alternative, and is not analyzed further.

MAXIMIZE WILDERNESS - RECOMMENDATION OF SUITABLE WILDERNESS FOR CONGRESSIONAL DESIGNATION

In 1996, the Secretary of the Interior directed that a new, limited inventory be conducted in Utah to determine the presence of wilderness characteristics in areas outside the boundaries of current Wilderness Study Areas proposed for permanent wilderness protection in Congressional legislation. This statewide wilderness inventory was temporarily enjoined by District Court order in November, 1996. The injunction was overturned by the 10th Circuit Court of Appeals in Utah v. Babbitt (10th Cir. 1998), after the scoping process for this plan was complete. Moreover, the wilderness inventory is a BLM statewide effort not specific to the Monument. Any wilderness recommendations that may follow the conclusion of this inventory would be too late to consider in this planning process for the Monument. If Congress should act to designate wilderness in the Monument, the wilderness designation would be effective without further BLM planning action. Nonetheless, the BLM would review the

Monument plan to determine whether confirming amendments would be necessary or advisable.

FULL FIELD MINERAL DEVELOPMENT

Oil and Gas Development

Full field mineral development of new and existing Federal oil and gas leases has not been analyzed as a separate alternative in this plan for the following reasons:

1. The Monument Proclamation legally controls and limits Federal mineral leasing or other disposition of Federal minerals. The Proclamation withdrew the Monument from future mineral leasing, and thus mineral development involving the issuance of future Federal mineral leases is not allowable. Mineral development under existing mineral leases would be the same under all of the plan alternatives. Such development would occur under valid existing rights (VERs), to which all of the alternatives analyzed herein are subject.
2. From a mineral resource perspective, the probability of successful development from exploration to full field development of oil and gas resources is low. The average success rate for wildcat oil and gas wells is less than 10 percent, and the BLM believes the likelihood of commercial quantities of oil and gas being present in the Monument is quite low. This is consistent with the record of the past 50 years of exploration, in which dozens of exploratory wells have been drilled without the discovery of commercial quantities of oil and gas (other than in the Upper Valley field). Based on these factors, the discovery and production of an oil or gas resource is not considered to be reasonably foreseeable, and therefore the impacts of oil and gas development are not analyzed in this plan.
3. Insufficient information is currently available to analyze the likely impacts of full field development. The BLM has received Applications for Permit to Drill (APDs) for exploration on oil and gas leases within the Monument, some of which are currently pending. APDs for exploration, however, are not the same as plans for full field development. Full field development assumes a discovery of an economic resource, production facilities, transportation facilities, and other infrastructure development. An analysis of such development goes beyond the impacts of exploration (usually of small extent and short duration) to impacts of development (large extent and long duration). Full field development would ordinarily be analyzed in a NEPA compliance document after exploration, not as a condition of exploration approval or part of the Monument plan. It is not known in advance whether petroleum will be discovered, let alone at what location or depth, in what quantity or viscosity, at what pressure, or whether it would be oil, gas, both, or neither. Thus, any attempt to "evaluate the environmental impacts" of full field development in this plan is not appropriate at this time.
4. Full environmental analysis will be required and will occur at the appropriate time. Adoption of the plan, or even approval of APDs for exploration wells, does not commit the BLM to any future actions, foreclose options for future proposals for oil and gas development in the Monument, or trigger full field development. If an exploration well drilled on an existing lease within the Monument were to encounter economic quantities of oil or gas, and an entity were to apply for drilling of field development wells, the BLM would prepare appropriate NEPA documents to analyze such a proposal before approving any development.

This staged approach to NEPA compliance has been upheld by the 10th Circuit in Park County Resource Council v. U.S. Department of Agriculture, 817 F.2d 609 (10th Cir. 1987). Such an approach does not constitute "piecemealing" of a larger project. The Monument Management Plan is independent of, and does not predetermine, the result of any future APD or development proposal. NEPA compliance will be conducted at such time that any future proposal is made; adequate information would then exist to identify precisely the proposed activities and to analyze the proposal and its impacts. The Interior Board of Land Appeals has upheld approval of an APD for an exploratory well without analysis of full field development (see Utah Chapter of Sierra Club, 120 IBLA 229).

Coal Development

This document does not address full development scenarios for coal for reasons similar to those cited above for oil and gas. The Monument Proclamation precludes new Federal coal leasing. The Proclamation preserved rights under existing Federal coal leases. Development of such leases would be based upon valid existing rights, and would be the same under all plan alternatives.

There are two holders of Federal coal leases within the Monument, PacifiCorp and Andalex Resources, Inc. PacifiCorp's Garfield County coal lease is located within a Wilderness Study Area, and was suspended in 1992. Before the establishment of the Monument, the Department of Interior entered into discussions with PacifiCorp concerning a possible relinquishment of the Garfield coal lease under 43 CFR subpart 3435. If such discussions do not result in the relinquishment of the PacifiCorp coal lease, development of that lease would be governed under the treatment of VERs in the BLM's Wilderness Study Guidelines, 48 Federal Register 31854-31855, and would not proceed until a termination of the suspension and the preparation of a site-specific NEPA compliance document.

Although PacifiCorp may certainly choose to exercise its valid existing rights, at this time, from a NEPA standpoint, the Department of Interior does not view coal development on PacifiCorp's Garfield County coal lease as being reasonably forseeable. If the exchange discussions between the Department and PacifiCorp are successful, the lease will be relinquished. If the discussions are not successful, PacifiCorp will continue to hold a coal lease in a Wilderness Study Area, which was suspended at PacifiCorp's request. No transportation infrastructure exists to transport the coal, placing the coal at a competitive disadvantage with regard to most existing coal markets for Utah coal. In addition, the coal would not meet Environmental Protection Agency standards for compliance with the Clean Air Act as utility fuel (absent scrubbers or equivalent technology), and market studies available to the Department of Interior project that a market for the coal would not exist until the year 2015. These factors make development of the coal lease unlikely.

Andalex holds 17 Federal coal leases in the Smoky Hollow area of the Monument. Although Andalex could seek to mine its coal under VER, subsequent to the establishment of the Monument it withdrew a permit application pending with the Utah Division of Oil, Gas, and Mining. Development of the Andalex coal leases would require the preparation of a site-specific NEPA compliance document. Under an agreement with Andalex, the Department of the Interior stopped work in December 1996 on such an environmental impact statement then in preparation.

Although Andalex may certainly choose to exercise its valid existing rights, at this time, from a NEPA standpoint, the Department of Interior does not view coal development of Andalex's Smoky Hollow coal leases as being reasonably forseeable. If discussions with the Department of Interior regarding potential lease exchange are not successful, Andalex would continue to hold the 17 Federal coal leases for which Andalex unilaterally withdrew its permit application. On ten of the leases, the Federal diligence obligations (43 CFR Part 3400) have recently restarted and the leases will expire in the year 2003 unless commercial production is achieved. The cost of building a haul road and transporting the coal to market places the coal at a competitive disadvantage with regard to most existing coal markets for Utah coal. Market studies available to the Department of Interior project that a market for coal from the Kaiparowits Plateau would not exist until the year 2015. These factors make development of the Andalex coal leases unlikely.

As with oil and gas, adoption of the Monument plan would not commit the BLM to any future action or foreclose options for future proposals for development of existing Federal coal leases in the Monument.

Hard Rock Mineral Development

This document does not address full development scenarios for hard rock minerals for similar reasons as for oil and gas. The Monument Proclamation precludes new location of mining claims under the 1872 Mining Law. The Proclamation preserved rights under valid existing mining claims, and development of such claims would be based upon valid existing rights (see Chapter 4 for a discussion of impacts of current operations).

Full environmental analysis would be required and would occur for actions requiring the BLM approval. Adoption of the Monument plan would not commit the BLM to any future actions or foreclose options for future proposals for development of existing hard rock mining claims in the Monument. The BLM would prepare appropriate NEPA documents to analyze such a proposal before approving any development.

DESIGNATION OF AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Some who participated in the scoping process suggested that the Monument plan include ACECs. ACECs are areas within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect human life and safety from natural hazards.

The BLM called for ACEC nominations in March of 1998. In addition, twenty-two nominations were brought forward from earlier planning efforts. After careful evaluation of the resources recognized in each of the nominations, it was determined that the protection of these resources would be equivalent under either Monument authority or ACEC designation, so no ACECs would be designated under the Monument Management Plan.

NATURAL ECOSYSTEM

Some commentors suggested that the BLM consider a Natural Ecosystem Protection Alternative. All of the alternatives analyzed provide protection to natural ecosystems, so a separate Natural Ecosystem Protection Alternative is not analyzed in detail.

SUPPORT LOCAL COMMUNITIES

Many of the scoping participants urged the BLM to support local communities through such measures as placement of facilities, funding for infrastructure, providing planning assistance and loans, hiring local people, preventing franchise and chain businesses in local communities, and using local preferences in providing services such as guides and outfitters. They also encouraged the BLM to enter into partnerships with local governments for support of search and rescue, etc. The BLM can participate in many of these types of activities regardless of the plan alternative selected. However, some of the suggested activities, such as preventing franchise businesses in local communities, are beyond the BLM's authority. For these reasons, a separate community support alternative has not been analyzed.

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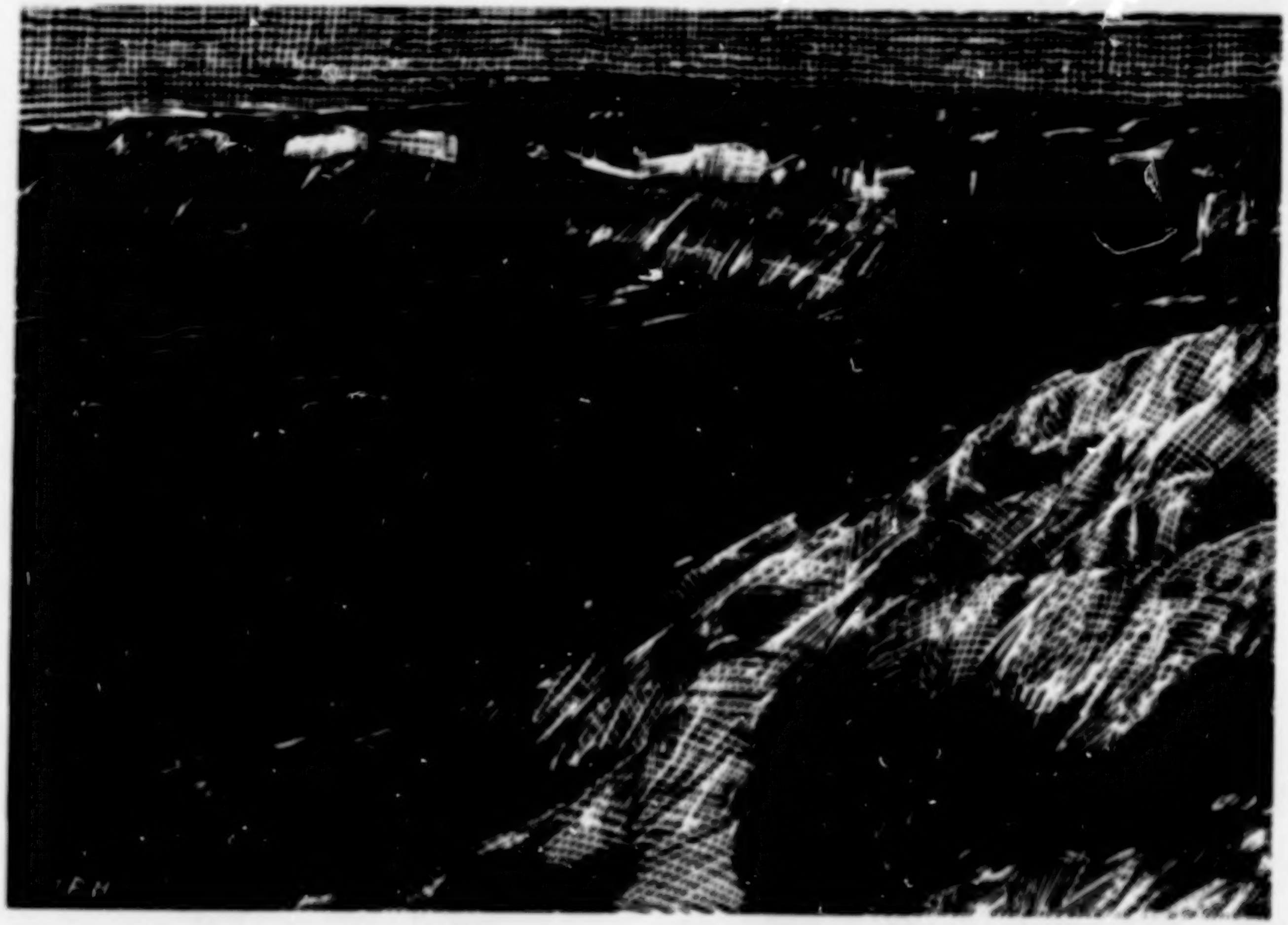
Chapter 3

Affected Environment



CHAPTER 3 - AFFECTED ENVIRONMENT

INTRODUCTION

The Proclamation establishing the Monument identified an array of scientific and historic resources that are to be protected. These resources include objects of biological, geological, paleontological, archeological, and historic interest. The Proclamation also requires an analysis showing the extent to which water is necessary for the care and protection of the resources.

This chapter contains a description of the existing physical, biological, cultural, social, and economic characteristics and resources of Grand Staircase-Escalante National Monument. The description of these resources serves as the baseline for analyzing and determining the effects of the various alternatives on resources. These resource descriptions are discussed only in as much detail as needed to analyze the effects of plan implementation. The affected environment is described according to the various Monument resources.

LAND OWNERSHIP

Grand Staircase-Escalante National Monument covers 1,684,899 acres of Federal land in south-central Utah. The Utah School Institutional and Trust Lands Administration manages about 175,000 acres of surface rights and 200,000 acres of mineral rights within the Monument boundary. About 15,000 acres of land within the Monument boundary are privately owned. Approximately 68 percent of the Monument is in Kane County, while the remaining 32 percent is in Garfield County. About 49 percent of Kane County and 18 percent of Garfield County lie within the Monument boundary (Figure 3.1) (Map 3.1).

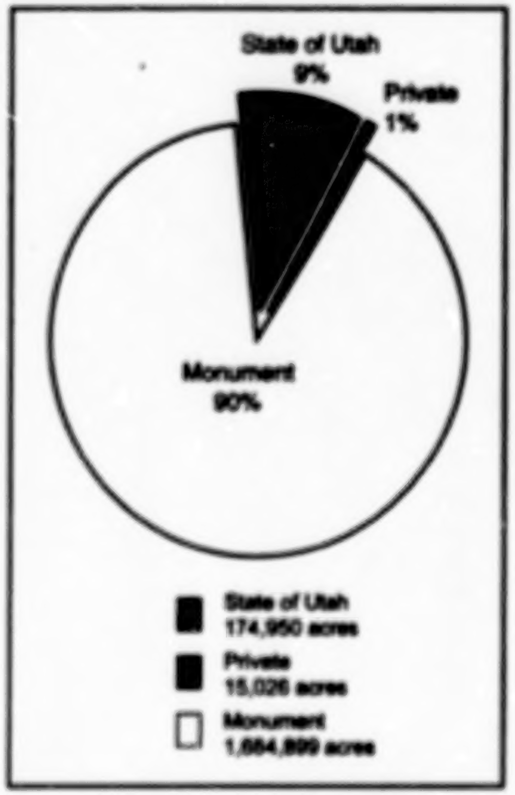


Figure 3.1 Land Ownership

The Monument is primarily surrounded by other public lands. Dixie National Forest borders the Monument to the north, Capitol Reef National Park to the east, Glen Canyon National Recreation Area to the east and southeast, Bryce Canyon National Park to the northwest, and other Bureau of Land Management (BLM)-administered lands to the south and west. Kodachrome Basin State Park also adjoins the Monument.

GEOLOGY AND PALEONTOLOGY

"...The monument is a geologic treasure of clearly exposed stratigraphy and structure...The monument includes world class paleontological sites..." (Proclamation 6920, 1996)

Regionally, the Monument is divided into three broad landscapes described (from west to east) as the Grand Staircase, the Kaiparowits Plateau, and the Escalante Canyons (Map 3.2). Approximately 270 million years of history is revealed in the exposed rocks of the Monument. The oldest rocks record a time when the equator angled northeast from southern California past the southeastern corner of Utah. The area of the Monument was a marginal lowland of streams, flood plains, and tidal flats. The sea lay to the west, but occasionally spread east across the area, leaving beds of limestone with sea shells, sponges, and other fossils between red beds of sandstone and mudstone. The Hermit, Toroweap, Kaibab and Moenkopi Formations, which crop out in the Circle Cliffs and at Buckskin Mountain, record events covering the first 35 million years of geological history in the Monument (Map 3.3)(Figure 3.2).

Remarkable specimens of petrified wood, such as logs exceeding 90 feet in length, occur in the Triassic Petrified Forest Member of the Chinle Formation found in the Circle Cliffs area. Fossils of other plants, fish, amphibians, reptiles, tracks of early dinosaurs, and freshwater clam and gastropod shells also give hints of this period of geologic history in the Monument. Beds of the Moenkopi, and the ledge formed by the Shinarump Member of the Chinle Formation, form the Chocolate Cliffs of the Grand Staircase in the southwestern part of the Monument.

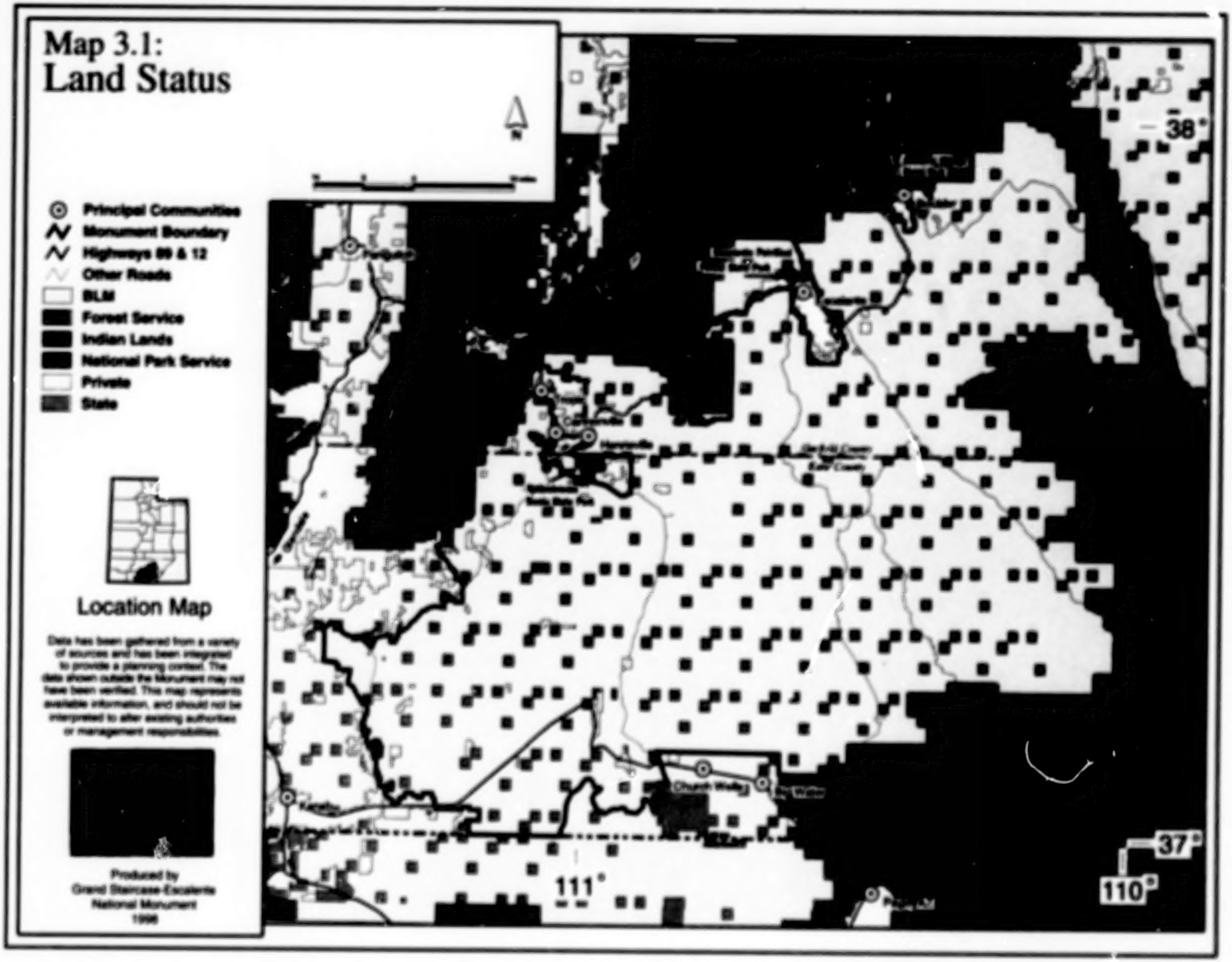
During the late Triassic, this region was again eroded before being covered by great sand dunes in early Jurassic time (208 to 187 million years ago). Early Jurassic rocks of windblown sand and stream deposits form the Vermilion (Wingate/Moenave and Kayenta Formations) and White cliffs (Navajo Sandstone) of the Grand Staircase, which comprise most of the prominent erosional features in the Escalante Canyons area. Though generally void of fossils, these rocks occasionally exhibit fossilized tracks of reptiles, including small to medium sized dinosaurs.

The middle Jurassic Carmel Formation is composed of color-banded layers of sandstone, limestone, calcareous shale, siltstone, gypsum, and mudstone deposited in and near the southern edge of a shallow sea. Limestone beds contain marine fossils of mollusks, brachiopods, crinoids, coral, and algae. As the sea retreated, dunes (Entrada Formation) formed on top of the Carmel Formation. The Late Jurassic Morrison Formation, deposited in lakes and east flowing streams, is found eastward and southeastward of the Kaiparowits Plateau. The Morrison is absent west of the Kaiparowits Plateau, removed by erosion prior to Late Cretaceous time. Middle and Late Jurassic sedimentary formations and erosional periods span time from about 180 to 144 million years ago.

After 45 million years of erosion and non-deposition during Late Cretaceous time, mountains rose to the west and provided sediments for streams flowing east into a great continental sea. This sea covered most of the interior continental United States from Alaska to the Gulf of Mexico. As sediment accumulated, the shoreline area sagged. This caused the sea to oscillate east to west for 30 million years at the end of the Cretaceous Period. This created a series of alternating terrestrial-marine deposits. The Dakota Formation was deposited on remnants of either the Morrison Formation (east) or Entrada and Henrieville Sandstone (west), and is a mix of stream sediments and near-shore marine deposits. The Dakota was covered by marine clays of the Tropic Shale. Deposition continued, becoming more terrestrial through time, resulting in the Straight Cliffs Formation, the Wahweap Formation, and the Kaiparowits Formation. These formations are seen on and around the Kaiparowits Plateau and form the Gray Cliffs of the Grand Staircase.

Extremely significant fossils, including marine and brackish water mollusks, turtles, crocodilians, lizards, dinosaurs, fishes, and mammals have been recovered from the Dakota and Tropic Shale, and the Tibbet Canyon, Smoky Hollow, and John Henry Members of the Straight Cliffs Formation. Within the Monument, these formations have produced the only evidence in our hemisphere of terrestrial vertebrate fauna, including mammals, of the Cenomanian-Santonian Ages. This sequence of rocks, including the overlying Wahweap and Kaiparowits Formations, contains one of the best and most continuous records of Late Cretaceous terrestrial life in the world.

Map 3.1: Land Status



Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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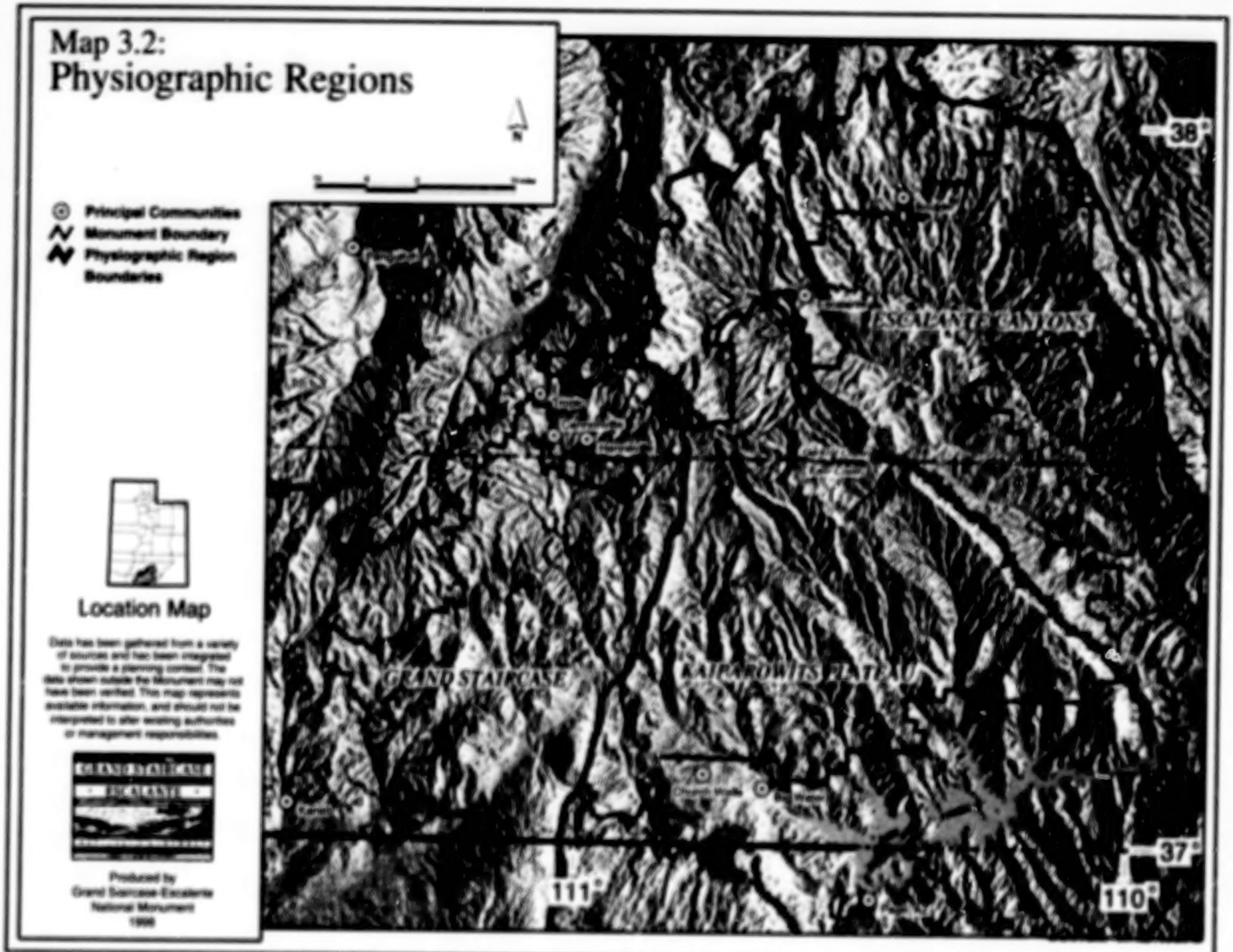
Grand Staircase-Escalante
National Monument
1998

Map 3.2:
Physiographic Regions



Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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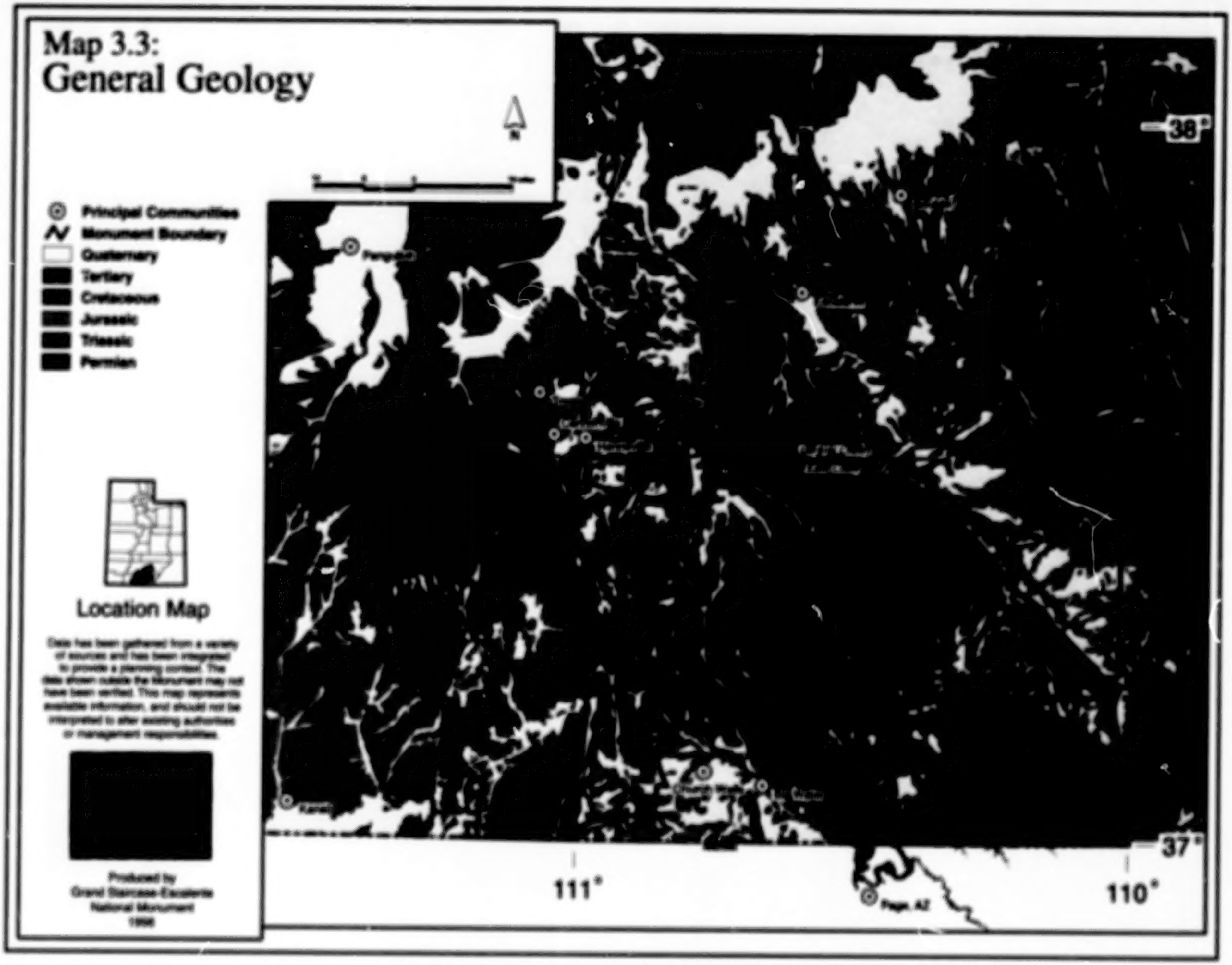

Map 3.3: General Geology

Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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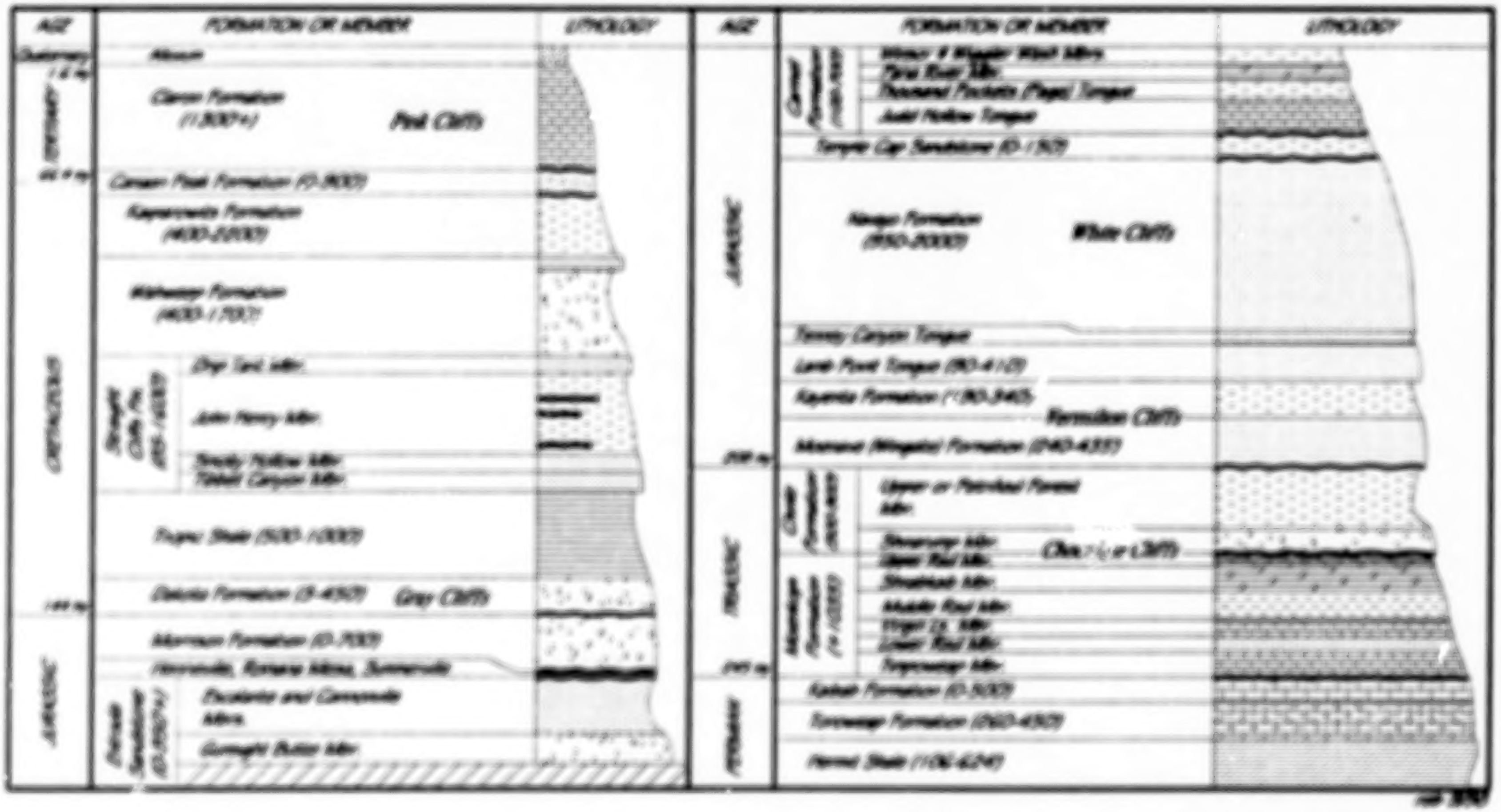
Grand Staircase-Escalante
National Monument
1998

Figure 3.2 Generalized Stratigraphic Column, Grand Staircase-Escalante National Monument (After Doelling and Davis, 1989)



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The Canaan Peak Formation straddles the boundary between the Cretaceous and Tertiary Periods. The beginning of the Tertiary Period marked the end of marine environments in or near the Monument. Several large lakes occupied an area from southwestern Wyoming to southwestern Utah. The Claron Formation, seen as the Pink Cliffs at Powell Point and Bryce Canyon, was deposited in lakes during this time. Uplift of the Colorado Plateau over the last 15 million years activated the erosional cycle, which uncovered geologic formations dating back 270 million years and created the present landforms. Fossils are known from all but three of the 20 sedimentary formations exposed in the Monument. Evidence of Pleistocene (< 1.6 million years) fauna may also occur in the Monument (Appendix 10).

Today, the region is relatively flat-lying strata, locally warped along north-south oriented folds that together form the three broad landscapes found inside the Monument. Many of these folds are anticlines, or geological upwarps opening downward, with one steeply dipping side, or limb, often called a monocline, and one gently dipping side. The east and west geologic boundaries of the Monument are the Waterpocket Fold, comprising the east limb of the Circle Cliffs anticline and the Paunsaugunt fault, respectively.

The generally northward-tilted strata of the Monument are structurally separated by the East Kaibab monocline (The Cockscomb), where strata dip up to 80 degrees. The Grand Staircase portion of the Monument lies west of The Cockscomb. Between The Cockscomb and the Straight Cliffs lies the Kaiparowits Plateau, a wedge-shape topographic highland which is also a geological basin comprised of Cretaceous-age rocks. Within the Kaiparowits Plateau numerous smaller but similar folds (Smoky Mountain, Upper Valley, Rees Canyon, and Escalante anticlines) are also present. Northeast of the Straight Cliffs and extending to the Waterpocket Fold lie the Escalante Canyons, a landscape typified by "slickrock" benches and many deeply dissected canyons.

Since the late 1800s geologists have studied the exposed rocks and surficial deposits within what is now the Monument. Geologic studies of southern Utah were first done during the course of government surveys by J. W. Powell, J. C. Fremont, and G. M. Wheeler. C. E. Dutton prepared the initial studies of the Southern Utah High Plateaus. H. E. Gregory later presented the geology and geography of the region through his papers on Zion National Park, the Paunsaugunt Plateau, and the Kaiparowits Plateau.

Geologic studies in the region have been made in conjunction with evaluations of mineral resources, particularly coal resources in the Kaiparowits Plateau. These studies are identified below.

1. The U.S. Geological Survey published a series of 1:125,000 scale maps illustrating various geologic aspects of the Kaiparowits Plateau (Price, 1977a, 1977b, 1978, 1979; Carter and Sargent, 1983; Hansen, 1978a, b; Sargent and Hansen, 1980, 1982; Williams, 1985; and Lidke and Sargent, 1983).
2. Hettinger and others (1996) combined all previous studies on the Kaiparowits Plateau and presented the U.S. Geological Survey's overall evaluation of the coal resources in the Kaiparowits coal field.
3. Stratigraphic studies by Peterson (1969) and Bowers (1972) led to the current formal divisions of Upper Cretaceous and Tertiary strata in the Monument region.
4. Sedimentological investigations by various workers (Shanley and McCabe, 1991; Shanley et. al., 1992; McCabe and Shanley, 1992; Hettinger et. al., 1994; and Hettinger, 1995) demonstrated the detailed relationships between coal-bearing continental and related marine strata and provided sequence stratigraphic divisions for the Upper Cretaceous rocks.
5. Doelling and Graham (1972) studied the coal resources of the Kaiparowits coal field and reported the results of their surveys of 24, 7.5-minute quadrangles.

6. Doelling and Graham (1972) also reported the results of similar work for several quadrangles in the Alton coal field near Bryce Canyon.
7. Doelling (1975) prepared a detailed report on the *Geology and Mineral Resources of Garfield County*.
8. Doelling and Davis (1989) emphasized geology, mineral resources, and geologic hazards in a report on *The Geology of Kane County*.

There are 20 sedimentary geological formations found within the Monument. These range in age from Permian (270 million years ago) to late Cretaceous (65 million years ago). Fossils are known from all but three of these formations. Quaternary sediments (younger than 1.8 million years) also occur in the Monument and have a potential for Pleistocene fossils.

Most of the recent paleontological research in the Monument has focused on Cretaceous formations of the Kaiparowits Plateau. Over the last two decades, researchers (Cifelli and Madsen, 1986; Cifelli and Eaton, 1987; Eaton, 1987a, 1987b, 1988, 1991, 1993a, 1993b, 1995; Eaton et. al., 1987; Kirkland, 1987; Eaton and Cifelli, 1988; Cifelli, 1990a, 1990b, 1990c; Cobban, 1993; Cifelli and Johanson, 1994; and Eaton et. al., 1997) have brought attention to the paleontological importance of Late Cretaceous formations within the Monument. The Grand Staircase and Escalante Canyons regions of the Monument expose formations of Permian, Triassic, and Jurassic age (Davidson, 1967; Doelling and Davis, 1989; Doelling, 1975; and Gillette and Hayden, 1997).

The BLM and Utah Geological Survey (UGS) entered into a Cooperative Agreement in an effort to better understand the abundance, distribution, and importance of fossils in the Monument. The project utilizes a UGS data base to relocate previously known paleontological sites in the Monument.

Gillette and Hayden (1997) published a preliminary inventory of paleontological resources within the Monument a few months after the Monument was established. They concluded that "Knowledge of the paleontology of all the formations in the monument is still rudimentary, as indicated by the recent intensified interest in the fossils of the Monument and vicinity. For all formations, fieldwork, museum curation, and laboratory analysis are essential."

Fossil collecting by professionals and non-professionals in the area now included in the Monument has a long history. Only recently has the need to manage paleontological resources on public lands been recognized.

Following the establishment of the Monument, the Secretary of the Interior issued Interim Guidance which closed Monument lands to collections except where intended for legitimate scientific purposes. Past practices have often treated fossil resources (such as petrified wood) as mineral materials to be managed as rip-rap or building stone. Prior to monument designation, BLM policy allowed for collection of petrified wood and invertebrate fossils (U.S. DOI, 1996 a,b,c). Fossils of invertebrates and trace fossils (tracks) are also known to have been collected on lands now within the Monument. Rockhounds collected a variety of minerals and invertebrate fossils including: petrified wood, agate, concretions, clinkers, gypsum, jasper, septarian nodules, pelecypods and cephalopods.

ARCHAEOLOGY

"...Archaeological inventories carried out to date show extensive use of places within the monument by ancient Native American cultures. The area was a contact point for the Anasazi and Fremont cultures, and the evidence of this mingling provides a significant opportunity for archaeological study..." (Proclamation 6920, 1996)

Archaeological sites are fragile, non-renewable evidence of human influence on the landscape. Only 75,559 acres (less than 5 percent of the Federal lands on the

Monument) have been inventoried for cultural resources, with 2,764 sites recorded to date.

Human use of the lands within the Monument has been documented for the Paleo Indian period, approximately 11,000 years ago. The end of this period was brought on by shrinking ice caps and major environmental changes in flora and fauna. The Archaic period (from about 7,000-500 B.C.) was characterized by nomadic hunters and gatherers who roamed the region on seasonal rounds. Limited evidence has been found on the Monument for this period. By at least 500 B.C., Basketmaker, Anasazi, and Fremont permanently settled in the region. Throughout their tenure these people continued traditions of hunting and gathering but relied more and more on agriculture as time passed. By 1300 these people had moved to the south and east, aggregating into larger villages; most likely at Hopi, Zuni, Laguna, Acoma, and the Rio Grande Pueblos. Scientific evidence for additional Native American Indian use of the Monument include the Paiute occupation by at least A.D. 1350. The Paiute practiced limited agriculture and utilized the entire Monument area for hunting and seasonal gathering rounds. Even later, more sporadic use of the Monument by the Navajo is indicated, but much less material evidence has been documented related to this culture.

Archaeological and historic sites are fragile, non-renewable, deteriorating resources. The Monument holds exceptional research opportunities for use and development of stabilization and conservation techniques and methods, as well as for understanding cultural and temporal adaptations by people to this landscape.

The most sensitive sites are rock art sites, rock shelters, sites with standing walls, wooden structures, and traditional cultural properties. These sites contain important information and perishable organic materials not found at other locations. Other significant sites include clusters of unique sites that represent contact between the Fremont and Anasazi in the Kaiparowits region.

Specific research questions include, but are not limited to: (1) the Fremont/Anasazi relationship, (2) the evolutions of agriculture in the American Southwest, and (3) cultural and social studies in association with paleontology, botany, wildlife, interests, and interfaces. Moreover, the "...cultural resources discovered so far in the Monument are outstanding in their variety of cultural affiliation, type and distribution..." (Proclamation 6920, 1996).

Because of the size and diversity of the landscape, the Monument may provide the geographic context to analyze site distribution data on the scale necessary to identify Anasazi and Fremont settlement patterns. We may also begin to understand regional site distribution patterns (incorporating data from adjacent lands). We can define their relationship with the environment in order to ultimately model the adaptive strategies employed by prehistoric peoples.

Human history is of interest to scientists and visitors alike. There are approximately 2,800 prehistoric sites in the Monument. These sites attract visitors to the area. There is also high interest in outfitter/guide tours to archaeological sites. Limited interpretation or information regarding site etiquette is currently available. Patrols and law enforcement efforts are also limited.

The Utah State Comprehensive Outdoor Recreation Plan (SCORP, 1992) includes the goal to "stop destruction and vandalism of...cultural, historic, and prehistoric resources in the State." Objectives associated with the State's goal are to:

1. Strongly encourage education programs for the public. These programs will assist the public in awareness of the importance of these sites so that vandalism can be reduced and controlled.
2. Encourage training and educational programs for personnel involved with historic parks and resources.

3. Implement additional disabled access provisions for both facilities and opportunities at historic sites (1992:335).

Contemporary Native American Indians recognize some sites and landscapes that are important to their cultural continuity today. These Traditional Cultural Properties and sites of tribal significance need to be managed sensitively in the context of expected increases in recreation demands and continued livestock grazing. The issues of protection of site location and sensitive information is of major concern to the tribes. Of particular interest to Native American Indians are concerns regarding collection of medicinal plants, piñon nuts, wood gathering, hunting, and access. Consultation is underway with the Kaibab Paiute, Paiute Tribe of Utah, San Juan Paiute, Hopi, Navajo, and Zuni groups.

HISTORY

"...The monument has a long and dignified human history; it is a place where one can see how nature shapes human endeavors in the American West, where distance and aridity have been pitted against our dreams and courage..." (Proclamation 6920, 1996)

The first European group to traverse the region and leave records was the Dominguez and Escalante expedition, which passed through the southern portion of the Monument in late October 1776. Trappers and prospectors had probably crossed this rugged landscape earlier, following the watercourses, but as elsewhere they left little or no documentation of their explorations of the region. In 1854 the first Mormons entered the region on an exploring trip to locate natural resources and scout for possible sites for new communities (Heath, 1997).

The region played an important part in the early scientific government exploration of the region. John Wesley Powell's mapping expedition used Flag Point, on the southern reaches of the Monument, as one of the main triangulation points for their baseline mapping of the region.

"A large part of the human history of the (Colorado) Plateau can be written in terms of its cliffs. The location of almost all the towns, roads, railroads, dams, and cultivated areas have had to be determined with due regard to these great natural barriers" (Stokes, 1973). These rugged features not only determined where people could travel but determined where and how water was available for people, livestock, and agriculture. Farming in this semi-arid region could only be established in areas where water for irrigation was available or could be made available through the development of canals, diversions, reservoirs, and ditches.

The Pahreah area was first settled in 1865 (around Rock House Spring). The Pahreah town site on the Paria River was settled in 1871, at the same time as the town of Adairville, by families that abandoned Rock House Spring. Adairville was abandoned a few years later, when the inhabitants moved up river to Pahreah.

Pioneers moved into the region of what is now eastern Garfield County beginning in the 1870s. Georgetown (1874-1900), Cannonville (1874), and Henrieville (1878) were settled by "refugees" from Pahreah after various flood events washed out most of the farmable soils surrounding the town. Escalante was settled by people from Panguitch in 1875. Tropic (1892) was settled by people from Cannonville and Henrieville only after the "ditch" was created from the East Fork of the Sevier across what is now the northern part of Bryce Canyon National Park. The first livestock in the Boulder area were brought in from Sanpete and Wayne Counties in 1879 and the first full time residents of Boulder arrived in 1889.

There are approximately 150 known historic sites within the Monument. Approximately 40 of these sites have been recorded.

The Monument has contracted for a Historical Resources Overview with the Utah Division of State History in the collection of oral histories. This includes topics related to the passage of the Taylor Grazing Act and the establishment of the Federal Grazing Service. It also includes the work carried out by the Civilian Conservation Corp and other activities that influenced the lands of the Monument.

AIR QUALITY

The existing air quality is typical of undeveloped regions in the western United States. Ambient pollutant levels are usually near or below the measurable limits. Exceptions include high, short-term localized concentrations of particulate matter (primarily wind blown dust), ozone, and carbon monoxide. Locations vulnerable to decreasing air quality include the immediate operation areas around mining and farm tilling, local population centers affected by residential emissions, and distant areas affected by long-range transport of pollutants.

The entire management area has been designated as either attainment or unclassified for all pollutants and has also been designated as Prevention of Significant Deterioration (PSD) Class II. Nearby PSD Class I areas include Capitol Reef, Canyonlands, and Arches National Parks to the east and north, and Bryce Canyon and Zion National Parks to the west.

Currently, air quality is not being monitored; however, levels are estimated to be low and within standards. Inhalable particulate matter (PM10) concentrations are expected to be higher near towns and unpaved roads. Regional PM10 levels are probably a result of fugitive (wind blown) dust.

Ozone levels in the Rocky Mountain Region are relatively high, but are of unknown origin. Elevated concentrations may be a result of long range transport from urban areas, subsidence of stratospheric ozone, or photochemical reactions with natural hydrocarbons. Occasional peak concentrations of carbon monoxide and sulfur dioxide may be found in the immediate vicinity of combustion equipment. The U.S. Environmental Protection Agency has recently established fine particulate matter (PM2.5) standards, although it will take some time before background measurements and regional levels can be identified.

PSD Class I regulations address the potential impacts on air quality related values. These values include visibility, odors, flora, fauna, soils, water, geologic, and cultural structures. A possible source of impact on these related values is acid precipitation. No visibility or atmospheric deposition data are currently collected in the Monument area.

The completion of a coal-fired electricity generating station at Page, Arizona in 1976 brought a major point source of airborne sulfur compounds to the area. The Navajo Generating Plant consists of three 750 MW units which burn a maximum load of 25,000 tons of coal per day. The plant has recently completed the installation of the first of three wet limestone scrubbers which will remove most of the sulfur dioxide from the emission plumes of the plant.

Visibility impacts occur from atmospheric increases in small, light-scattering particles or increases in light absorbing-gasses (typically nitrogen dioxide. Mechanisms of acid precipitation formation are currently under study, but results have correlated ambient sulfuric and nitric acids with combustion by-products (sulfates and nitrates).

The State has determined that the greatest impact to visibility in Utah is uniform regional haze moving into Utah from other areas. Utah is a partner in the Western Regional Air Partnership, a collaborative effort of western states, tribes, and Federal agencies to address western regional air quality concerns. One of its primary roles is to coordinate visibility protection options recommended by the Grand Canyon Visibility Transport Commission.

SOIL AND CLIMATE

"...Fragile cryptobiotic crusts, themselves of significant biological interest, play a critical role throughout the ecosystem, stabilizing the highly erodible desert soils and providing nutrients to plants..." (Proclamation 6920, 1996)

Cryptobiotic soil crusts, also referred to as cryptogamic or microbiotic, are composed of living organisms and their by-products which form a crust of soil particles bound together by organic material. These crusts are composed of cyanobacteria, algae, mosses, and lichens. Cryptobiotic crusts are widespread on various soil surfaces throughout the Monument. These crusts perform many important ecological functions including: preventing soil erosion, fixing atmospheric nitrogen by means of cyanobacteria, improving plant soil-water relationships, contributing to nutrient cycling, and providing sites for seed germination and plant growth. These crusts are particularly sensitive to ground disturbance, especially compression caused by such occurrences as vehicle or foot traffic (Belnap, 1994).

Understanding the condition of soils is important to the management of many resources. Available data on soils varies across the Monument. Currently, there are three levels of available data for the Monument.

- Kane County Soil Survey: This unpublished survey was conducted at a scale of 1:63,360 (1 inch per mile). Due to a lack of interpretive value for this survey, the Kane County portion of the Monument is being remapped and updated to a scale of 1:24,000 (1 inch = 2,000 feet).
- Panguitch Area Soil Survey: This published report covers a small portion of the Monument in the Tropic, Cannonville and Henrieville areas, Upper Valley area and around "The Blues." The farming areas near Escalante and Boulder are also represented in this survey and add some insight to the soil data in the adjacent areas.
- STATSGO: The State Soil Geographic Database is generalized soil survey information for the entire state of Utah. This data was collected at a scale of 1:250,000 (1 inch = 4 miles) and can be used at a county or regional level.

In order to improve the information base, the BLM has commissioned a third order soil survey. A third order survey is made for land uses not requiring precise knowledge of small areas or detailed soil information. This type of survey is conducted on all National Forest lands and the majority of private and public rangelands. The survey is expected to be completed in 2001.

Annual precipitation varies from about 6 inches at the lowest elevations to approximately 25 inches at the highest elevations. The variations in elevation and precipitation produce three different climate zones: upland, semi-desert, and desert. At the highest elevations, precipitation falls primarily in the winter. The majority of the rainfall in the semi-desert areas occurs during the summer months.

The climatic zones and general soils information are summarized in Table 3.1 (Jaros, personal communication, 1/16/98).

Table 3.1
Climate Zones

	Desert	Semi-desert	Upland
Precipitation (inches)	6 to 8	8 to 12	12 to 16
Temperature (degrees F)	50 to 57	47 to 55	43 to 50
Frost Free Period (days)	170 to 200	125 to 170	100 to 125
Elevation (feet)	4000 to 4800	4800 to 6200	6200 to 7500

The Desert climate zone is found in two general areas of the Monument:

1. The Sooner Bench area of Hole-in-the-Rock Road is typified by soils of very minimal development. Structural benches and dunes on Navajo and Entrada Sandstone, the Carmel Formation, and Quaternary alluvial deposits characterize this area. Dominant vegetation for this area includes blackbrush, mormon tea, broom snakeweed, indian ricegrass, and galleta.
2. The Big Water area is typified by soils of very minimal development. Hill slopes and badlands on Tropic Shale, Dakota Formation, and lower members of the Straight Cliffs Formation characterize this area. Dominant vegetation for this area includes mat saltbush, shadscale, galleta, and bottlebrush squirreltail.

The Semi-desert climate zone is found in four general areas of the Monument:

1. The western area of Hole-in-the-Rock Road is typified by very deep (>60 inches) soils. Structural benches and dunes on Entrada Sandstone, the Carmel Formation, and Quaternary alluvial deposits characterize this area. Dominant vegetation for this area includes indian ricegrass, needle-and-thread grass, globemallow, four-wing saltbush, mormon tea, and winterfat.
2. The Phipps-Death Hollow area is typified by soils with shallow to very deep (10 to >60 inches) sandy textures that have been deposited through wind movement from the Navajo Sandstone parent material. Dune topography intermixed with outcroppings of Navajo Sandstone characterize this area. Dominant vegetation for this area includes indian ricegrass, needle-and-thread grass, sandhil muhly, four-wing saltbush, and sand sagebrush.
3. The Circle Cliffs area is typified by shallow soils (10 to 20 inches deep). The Moenkopi and Chinle Formations and the Kaibab Limestone dominate as the parent material of this area. Dominant vegetation for this area includes galleta, locoweed, bigelow sagebrush, shadscale, and Utah juniper.
4. The Highway 89 area between Johnson Canyon and The Cockscomb is typified by very deep soils (>60 inches deep). The Moenkopi Formation and Quaternary alluvial deposits dominate as the parent material of this area. Dominant vegetation for this area includes indian ricegrass, galleta, winterfat, and big sagebrush.

The Semi-desert to Upland transition climate zone is found in two general areas of the Monument:

1. The Death Ridge, Carcass Canyon and Burning Hills areas are typified by shallow soils (10 to 20 inches deep). The Straight Cliffs Formation dominates as the parent material of this area. Typical landforms consist of structural benches with highly dissected side-slope canyons and badland areas of exposed geologic materials. Dominant vegetation for this area includes galleta, blackbrush, mormon tea, and Utah juniper.
2. The Fortymile Bench area is typified by shallow to moderately deep soils (10 to 40 inches deep) over the John Henry Member of the Straight Cliffs Formation. Typical landforms consist of structural benches with highly dissected side slope canyons. Dominant vegetation for this area includes Utah juniper, piñon pine, galleta, mormon tea, and bigelow sagebrush.

The Upland climate zone is found in three general areas of the Monument:

1. The Fiftymile Mountain area is typified by shallow to moderately deep soils (10 to 40 inches deep) over the John Henry Member of the Straight Cliffs Formation. Typical landforms consist of structural benches with highly dissected side slope canyons. Dominant vegetation for this area includes indian ricegrass, galleta, rock goldenrod, bigelow sagebrush, mormon tea, piñon pine, and Utah juniper.

2. The Kodachrome Basin and Skutumpah Road area is typified by diverse soil properties that are found on the Carmel Formation and Quaternary alluvial deposits. Landforms consist of dissected side slopes and alluvial fans and flats. Important vegetation for this area includes indian ricegrass, galleta, big sagebrush, bitterbrush, piñon pine, and Utah juniper.
3. The Paria/Hackberry area consists dominantly of Navajo Sandstone geology with varying depths (20 to >60 inches deep) of sand. Landforms consist of vegetated dunes and outcroppings of sandstone. Dominant vegetation for this area includes sand dropseed, indian ricegrass, blue grama, mormon tea, piñon pine, and Utah juniper.

VEGETATION

"...The monument contains an extraordinary number of areas of relict vegetation...where natural processes continue unaltered by man..." (Proclamation 6920, 1996)

The size and location of the Monument allow for its inclusion in three main sections of the Colorado Plateau floristic region: the eastern part of the Canyonlands section, the southern portion of the Utah Plateaus section, and a small north-eastern portion of the Dixie Corridor section (Cronquist, 1972). The blending of these three areas in the Monument provides the potential for a high degree of diversity. Steep canyons, limited water, seasonal flood events, unique and isolated geologic substrates, and large fluctuations in climatic conditions have all influenced the composition, structure, and diversity of vegetation associations of this region. These same factors have also made access into these areas difficult, leaving much undiscovered.

Coarse scale vegetation mapping exists through the Utah GAP program, but this information has not been field checked as it relates to the Monument. Nine primary vegetation associations occur within the Monument as described by Welsh (1993) and Cronquist (1972). These vegetation associations are summarized in Appendix 11. Precipitation (elevation), geology, and soil type are the primary factors influencing the distribution of vegetation associations in the area. Some areas, however, do not fit into vegetation categories. These include: areas traditionally low in diversity (barren areas), treated areas (seedings, chainings), flooded areas (reservoirs), and rock outcrops.

Relict plant communities refer to areas that have persisted despite the pronounced warming and drying of the interior west over the last few thousand years (Betencourt, 1984) and/or have not been influenced by settlement and post-settlement activities; chiefly domestic livestock grazing. This isolation, over time and/or from disturbance, has created unique areas that can be used as a baseline for gauging impacts occurring elsewhere in the Monument and on the Colorado Plateau. The locations of some of these relict areas are known, but little if any information has been collected on the composition and structure of the vegetation associations or other physical and biological components.

Hanging gardens occur where ground water surfaces along canyon walls from perched water tables or from bedrock fractures. The existence of hanging gardens is dependent on a supply of water from these underground water sources. The geologic and geographic conditions for hanging gardens exist throughout southern Utah (Welsh and Toft, 1981), including the Monument. Inventory work was conducted in conjunction with the Kaiparowits Study (Murdock et. al., 1971-1974), which determined the location and species composition of several hanging gardens. The potential for additional locations of hanging gardens in the Grand Staircase and Escalante sections of the Monument is also high. Due to the conditions of isolation produced in hanging gardens there is a potential for unique species in these areas.

Mosses, liverworts, and lichens are vegetative life forms that have been overlooked due to their inconspicuous nature. This large group of organisms has been studied to some degree in other areas of southern Utah, but limited information about these organisms exists for the Monument area specifically.

The unique topography, variety of geologic substrates, and presence of hanging gardens and relict areas have all contributed to the presence of many endemic plants. Known to be located within the Monument boundaries are one Federally listed endangered and two Federally listed threatened plants. In addition to these, there are others just outside the boundaries that are Federally listed as threatened. The protection of the Federally listed species is governed by the Endangered Species Act, and activities relating to these species are coordinated with the U.S. Fish and Wildlife Service (FWS). The Federally listed species are joined by a list of sensitive species, with limited distributions and/or population sizes, that warrant special consideration during activity planning (Appendix 12). Listed and sensitive species, in and around the Monument, have been monitored over the years and will continue to be studied to ensure that actions are taken to recover Federally listed species, and that actions are not taken which would lead to listing of any sensitive species.

Consultation with FWS under section 7 of the Endangered Species Act was begun by letter on April 1, 1998. A list of threatened and endangered species was requested. A copy of the letter from Fish and Wildlife Services appears in Appendix 13. The letter lists one endangered and two threatened plant species which may occur within the Monument. No candidate species are identified. This document is being reviewed by the FWS to determine if the alternatives may affect any listed species or its critical habitat, or if the alternatives are likely to jeopardize a proposed species or result in the destruction or modification of proposed critical habitat. In the case of a "may affect" finding, consultation or conferencing on the affected species would begin and the results would be included in the Proposed Management Plan/Final Environmental Impact Statement.

There is one Federally listed endangered plant species known within the boundaries of the Monument. Kodachrome bladderpod (*Lesquerella tumulosa*) is located in the Grand Staircase portion of the Monument. Surveys for this species were conducted in 1989 and a draft recovery plan is being prepared. Current taxonomic research is underway to address inconsistencies in classification of this species. Threats to these populations include cross-country vehicle travel, cattle grazing, and fuelwood cutting.

The two Federally threatened plants known to occur within the boundaries of the Monument are listed below. Two vegetation studies, begun in 1998, will survey areas of the Monument for potential additions to this list, or additional populations of these species.

1. Ute ladies'-tresses (*Spiranthes diluvialis*) was listed as a threatened species on January 17, 1993. This plant grows in moist riparian meadows or stream banks. This plant species is dependent on the unimpeded natural water flows and stream channel changes that occur in the watershed in which it grows. One population is known to exist in the Monument, in the Escalante Canyons section. A recovery plan has been prepared for this species. Currently, the greatest threat is from recreation use.
2. Jones' Cycladenia (*Cycladenia humilis var. jonesii)* grows on clay deposits in central and southern Utah and northern Arizona. Some work was done to survey for populations and establish monitoring in Glen Canyon National Recreation Area (Spence, 1994). These populations are close to the populations in the Monument and may have included Monument populations. The influence of soils on distribution has been studied by Boettinger (1998). Mining, grazing, and off-highway vehicle travel all occur in the area, but are currently not threatening the populations because of its relative inaccessibility.

The location of the Monument on the Colorado Plateau and the unique and isolated geologic substrates have contributed to the botanical diversity of the area. The potential is great for research on many aspects of these vegetation associations.

Although much is known about the general structure and context of vegetation in the Monument (Albee et.al., 1988; Atwood et.al., 1991; Barneby, 1989; Cronquist, 1994; Cronquist et.al., 1972; Cronquist et.al., 1977, 1984, 1997; Welsh and Toft 1981; Welsh et.al., 1975; Welsh et.al., 1978; and Welsh et.al., 1993), little detailed information has been collected in the area. Isolated intensive studies and voucher collections over the last 50 to 100 years provide some insight into the potential diversity.

Collection of wildland seed, though labor intensive, is common on public lands. The demand for native seed in restoration projects in the West has increased collection efforts. Limited information is known on the quantity of seed collected or the location of seed collection sites in the Monument.

Human disturbances have contributed directly and indirectly to the loss of plants and plant associations from many areas, including the Monument. Direct impacts from physical removal of vegetation by chaining, spraying, cutting, and consumption by livestock are evident. Much of the disturbance we see today is the result of intensive grazing activities at the beginning of the 20th century. Recovery from these impacts is slow and in some cases may never occur, or may require intensive restoration efforts. A secondary effect of disturbance is the introduction of invasive non-native species. Many plants were brought in specifically for forage. Other plants, such as cheatgrass, were introduced accidentally in livestock feed or through incidental transportation. These non-native plants, whether introduced accidentally or intentionally, continue to displace native species and dramatically affect the structure of sensitive plant associations (such as riparian and threatened and endangered plant populations). Once established in disturbed sites, non-native plant species quickly spread out into adjacent undisturbed lands and disrupt the natural plant and animal associations. Tamarisk, for example, absorbs large quantities of water, making surface water unavailable to wildlife and other riparian plant species.

Numerous policies and guidelines for control of these noxious weeds have been developed. The Partners Against Weeds Action Plan (January 1996), prepared by the Bureau of Land Management, describes the process to begin controlling this problem on public lands and beyond. Weed free hay certification has become a standard policy on Utah BLM lands as well. By working cooperatively with adjacent agencies and the private sector we can begin to control these invasive species.

The primary avenue for the dispersal of weeds is along transportation corridors, including trails. Disturbance activities involved in maintenance and construction of these corridors create ideal habitat for invasive non-native species. Vehicles, as well as people and animals using these travel corridors, act as vectors for the spread of these weeds to previously unaffected areas. Inventory work completed in 1997 by Ecosphere Environmental Services surveyed the travel corridors (mainly roads) to determine the location of noxious weed species in the Monument area. Of the 35 species that were surveyed for in the Monument, only 9 were found (Appendix 14).

RIPARIAN

"...Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument..." (Proclamation 6920, 1996)

Riparian refers to vegetation and habitats that are dependent upon or associated with the presence of water. Riparian areas comprise the transition zone between permanently saturated soils and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water. Examples of riparian areas include lands along perennially and intermittently flowing rivers and streams and the shores of lakes and reservoirs with stable water levels. Other examples are wetlands, represented by marshes and wet meadows.

Riparian areas, though they total less than 1 percent of the total lands in the Monument, are some of the most productive, ecologically valuable, and utilized resources. The Riparian-Wetland Initiative for the 1990s established national goals and objectives for managing riparian-wetland resources on public lands. One goal is to provide the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection.

A number of plant and animal species depend on riparian areas. Up to 80 percent of vertebrates use riparian habitats at some stage in their lives. Over 50 percent of the nesting bird species in this region use riparian habitats as the primary habitat for breeding purposes. This species richness is made possible by the plant diversity, availability of water, prey species, and the proximity to upland communities with their floral and faunal diversity.

The BLM has completed a Proper Functioning Condition (PFC) Assessment on 8,288 acres of riparian areas within the Monument. This represents approximately 80 percent of the total riparian areas within the Monument. The PFC method is a field evaluation that analyzes a riparian-wetland areas' capability and potential (BLM, 1993, 1994). The process of assessing whether a riparian-wetland area is functioning properly requires an interdisciplinary team approach of resource professionals familiar with the area being rated. The team looks at three components: (1) vegetation, (2) landforms/soils, and (3) hydrology. The riparian area is then placed in one of four categories: Proper Functioning Condition, Functional-At-Risk, Non-Functional, or Unknown. Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows (Prichard, 1993, 1994). This reduces erosion, improves water quality, filters sediment, captures bedload, aids floodplain development, improves flood-water retention and ground-water recharge, develops root masses that stabilize stream banks, provides habitat necessary for fish production and waterfowl breeding, and supports greater biodiversity. Functioning condition is a result of the interactions among geology, soil, water, and vegetation. The PFC assessment is not an ecological rating of vegetation communities. The PFC assessment produced the results found in Table 3.2.

Table 3.2
Proper Functioning Condition Assessment

PFC Category	Acres
Properly Functioning	2385
Functional-At-Risk	5293
Non-Functional	21
Unknown	589

A base flow of water is mandatory for the health and functioning of riparian areas. Factors which interfere with these processes include water diversions, ground water withdrawals from wells, and changes in vegetation type and cover. Certain activities can also result in degraded water quality and levels of seasonal flow. Resulting changes may be seen in the type and structure of vegetation communities, increased water temperatures, unsatisfactory physical functioning of hydrologic processes, aesthetics, and wildlife habitat.

FIRE

Vegetation in the Monument evolved with fire as a minor part of the ecosystem, as is evident from the flora and soil characteristics. Periodic fires did occur in the Monument, but little information is known about the frequency or size of these fires. Intensive livestock grazing in the late 1800s and early 1900s drastically changed the vegetation structure, including the removal of native shrubs and forbs. Reduced understory from grazing has allowed piñon and juniper to thrive beyond natural limits in some areas.

Before 1980 little information was kept on the occurrence of fire in the Monument. Since 1980 there have been 218 reported fires, most of which have been lightening strikes, with an average size of 7 acres. The largest recorded fire is 552 acres, which occurred on Fiftymile Mountain. Although there has been some response to these fires, little suppression activity has occurred to control these fires. Wildfires have occurred in a variety of vegetation types.

The Monument is part of the Color Country Interagency Fire Management Area. This areas includes Iron, Washington, Beaver, Kane, and Garfield Counties in Utah, and the BLM Arizona Strip Field Office lands of Mohave County in Arizona. This area was established to share resources in southwestern Utah. Zones and policies, provided in the Cedar City District Fire Management Plan, establish how suppression activities will be managed in the entire area, including the Monument. Most of the Monument is included in zones that have little suppression activity. Some full suppression zones occur within the Monument, found in areas where protection of structures and property are a concern. Protection of other resources is fully integrated into the fire management strategies for all of the zones in southern Utah.

Past use of prescribed fire has involved the burning of piñon and juniper woodlands to reduce density and promote the growth of understory shrubs and grasses. The primary purpose of these burns was to increase forage for livestock and wildlife by removing encroaching piñon and juniper stands. Since 1986 there have been 11 management ignited prescribed fires in the Monument, burning a total of 2,870 acres.

FORESTRY PRODUCTS

Piñon pine and juniper woodlands cover about 425,000 acres of the Monument. There are scattered stands of ponderosa pine, douglas fir, and white fir, mainly confined to the higher elevations or cooler north-facing slopes. Currently, the products from piñon pine and juniper woodlands are for personal use fuelwood, juniper posts, and Christmas trees. Cutting and collecting of standing dead and down wood is allowed under personal use fuelwood permits. There are limited areas currently designated for live tree fuelwood cutting. No commercial timber harvesting has occurred in the Monument for decades. A timber harvest of ponderosa pine did occur in the 1940s on Mud Spring Bench. A reforestation project was also accomplished after the sale closed.

WILDLIFE

"...The wildlife of the monument is characterized by a diversity of species..."
(Proclamation 6920, 1996)

The Monument provides habitat for nearly 400 species of vertebrates and 1,112 species of invertebrates. To date there have been 9 amphibian, 243 bird, 20 fish, 63 mammal, and 27 reptile species identified within the Monument. Some animals are migratory through the Monument, others are year-round residents, and still others use the Monument as seasonal habitat. A complete list of wildlife species found within the Monument is located in Appendix 15.

Populations of elk move into the Monument for winter use. Mule deer and bighorn sheep are year-long residents. The river and stream systems provide habitat for fish, while riparian areas are the main habitat for many bird species.

The establishment of the Monument does not diminish the responsibility and authority of the State of Utah for management of fish and wildlife, including regulation of hunting and fishing, on Federal lands within the Monument.

Consultation with FWS under section 7 of the Endangered Species Act was begun by letter on April 1, 1998. A list of threatened and endangered species was requested. A copy of the letter from the Fish and Wildlife Service appears in Appendix 13. The letter lists eight endangered or threatened animal species which may occur within the area of influence of the Monument Management Plan. No candidate species are identified. This document is being reviewed by the FWS to determine if the alternatives may affect any listed species or its critical habitat, or if the alternatives are likely to jeopardize a proposed species or result in the destruction or modification of proposed critical habitat. In the case of a "may affect" finding, formal consultation or conferencing on the affected species would begin and the results would be included in the Proposed Management Plan/Final Environmental Impact Statement.

Found within the Monument are five species of wildlife Federally listed as threatened or endangered. Those species include:

1. The American peregrine falcon (*Falco peregrinus anatum*) is found in the Monument from early March until early fall. The peregrine falcon was listed as endangered on June 2, 1970. Since the adoption of the recovery plan (December 14, 1984) this population has grown until it is now common to see falcons in the Monument. The peregrine falcon population has risen to a point that steps are being taken to delist the species.
2. The southwestern willow flycatcher (*Empidonax traillii extimus*) was listed as endangered on February 27, 1995. The southwestern willow flycatcher has been observed along the Escalante and Paria Rivers. At the present time there is no recovery plan for the flycatcher. The flycatcher is present in Utah from early spring until migration occurs in the fall.
3. The California condor (*Gymnogyps californicus*) was listed as endangered on March 11, 1967. On October 16, 1996, a population to be released in northern Arizona was listed as an experimental, non-essential population. Six California condors were released at the Vermilion Cliffs in northern Arizona on December 12, 1996. Additional releases have occurred since. These birds have been sighted in Bryce Canyon National Park, where they may have flown over the Monument.
4. The bald eagle (*Haliaeetus leucocephalus*) is found in and around the Monument as a winter migrant, roosting in large trees and hunting in areas around the roost sites. The bald eagle was first listed as threatened on March 11, 1967. A recovery plan was adopted on July 29, 1983. The bald eagle population has risen to a point that steps are being taken to delist the species.
5. The Mexican spotted owl (*Strix occidentalis lucida*) was first listed as threatened on March 16, 1993, with a recovery plan being adopted on October 16, 1995. Little is known about the spotted owl in the Monument, with only a few confirmed nest sites.

In addition to the above listed species, the Colorado squawfish (*Ptychocheilus lucius*) and razorback sucker *(Xyrauchen texanus)* were once found in the Colorado River prior to the construction of Glen Canyon Dam. There are no known records of these two fish within the boundaries of Grand Staircase-Escalante National Monument.

Populations of the Kanab ambersnail *(Oxyloma haydeni kanabensis)* are found outside the boundaries of the Monument. There are no known records of this species inside the Monument.

A list of sensitive wildlife species found within the Monument can be found in Appendix 16.

Few wildlife studies have occurred on Monument lands. Between 1971 and 1976, Brigham Young University researchers studied vertebrate species as part of the environmental assessment for the then proposed Kaiparowits power plant. Atwood and others (1980) list inventories from the 1930s along with other studies accomplished prior to the construction of Glen Canyon Dam.

Studies conducted by the BLM during the summer of 1997 showed that 13 of the 19 species of bats found in Utah were identified within the boundaries of the Monument. This work added to the list of bat species recorded for this area (Jackson and Herder, 1997).

In 1997, Peterson and O'Neill (1997) found southwestern willow flycatchers in both the Paria and Escalante River riparian corridors. The known breeding population is estimated at between 300 and 500 pairs; it is known to breed at only about 75 sites within its range, the desert southwest. The population decline is due to the extensive loss, fragmentation, and modification of riparian breeding habitat, which has reduced, degraded, and eliminated nesting habitat, curtailing the distribution and numbers of the southwestern willow flycatcher throughout its range. Brood parasitism by the brown-headed cowbird is also considered a significant and widespread threat to the southwestern willow flycatcher, which appears to be unable to successfully rear its own chicks when cowbird chicks are present (U.S. Department of Interior, 1997). The flycatcher is also listed on the State of Utah Sensitive Species list as endangered.

The southwestern willow flycatcher nests in dense riparian vegetation, typically near surface water or saturated soil. Other habitat characteristics vary widely among sites. Migrants may occur in non-riparian habitats or in riparian habitats not suitable for breeding. Such areas may be critically important resources affecting local and regional flycatcher productivity and survival. The flycatchers' breeding range includes extreme southern portions of Utah. They winter in Mexico and Central America, although specific wintering sites are unknown (U.S. Department of Interior, 1997).

There have been few studies on the native fish and amphibian species in the Escalante River system. Holden (1974) performed the most recent fish survey. He found populations of non-native species in the lower reaches of the Escalante River and speculated that they may be negatively affecting the native populations.

Big game hunting and associated activities within and adjacent to the Paunsaugunt region of the Monument provide income to local residents. The Paunsaugunt deer herd is recognized world wide by both hunters and wildlife viewers. From data collected by UDWR, this population is the largest population of trophy class mule deer in the western United States.

There are seasons set by the State Wildlife Board for the hunting of the following species within the Monument: deer, elk, bear, cougar, bobcat, ringtail, cottontail rabbit, mink, beaver, badger, desert bighorn sheep, chukar, mourning doves, ducks, geese, coots, pheasant, turkey, forest grouse, fox, and fish. Harvest data, which includes the number of hunter days and species taken, can be found in various UDWR harvest reports.

Under the direction of the Utah Legislature, UDWR is required to manage mule deer and elk according to the adopted plan for each species and management unit. Portions of three wildlife management units fall within the Monument boundaries: Kaiparowits, Paunsaugunt, and Plateau (see Table 3.3). An overview of the herd unit management plans for mule deer and elk can be found in Appendix 17.

Table 3.3
Wildlife Management Units

Unit Name	Total Acres	Acres in Monument	Percent in Monument
Kaiparowits	2,008,332	1,171,782	69%
Paunsaugunt	957,086	384,507	23%
Plateau	2,108,929	128,610	8%

Since 1980, bighorn sheep have been reintroduced by the UDWR and BLM into the Monument area. The goal of these reintroductions is to restore populations to historic ranges. This will be accomplished with up to 200 animals, as they become available from other areas in the State or the West.

Wild turkey and pronghorn antelope have also been reintroduced by UDWR into their historic ranges within the Monument. The first reintroductions took place in 1958, near Boulder, with 15 turkeys released. Turkeys have established viable populations since this program was initiated. Twenty two pronghorn antelope were reintroduced on East Clark Bench in 1970. An additional 105 antelope have since been reintroduced (Smith and Beale, 1980).

Introductions of non-native wildlife species, such as chukar and brown trout, have been successful. These species are now permanent residents of the Monument. The brown trout population in Calf Creek provides an opportunity for watching wildlife; visitors can easily view these fish from the Calf Creek Trail. Brown trout also provide visitors with recreational fishing opportunities. Chukar populations are found in remote areas of the Monument, where they are viewed and/or hunted.

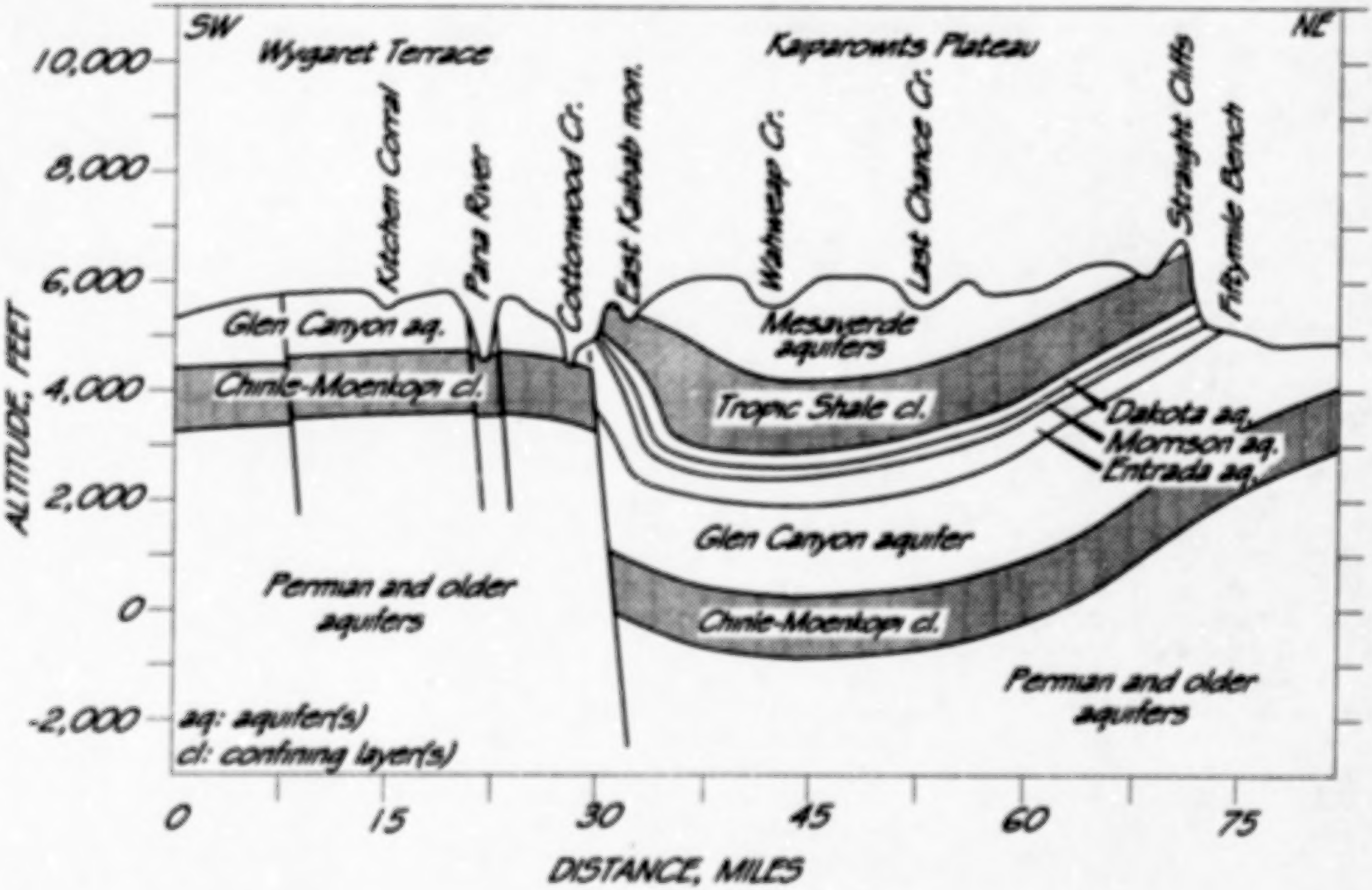
WATER

"...with scarce and scattered water sources, the monument is an outstanding biological resource..." (Proclamation 6920, 1996)

The Monument crosses four broad watersheds, all part of the Colorado River system. The Escalante River system (including Alvey Wash, Pine Creek, Mamie Creek, Sand Creek, Calf Creek, Boulder Creek, Deer Creek, and Steep Creek) flows from the Aquarius Plateau and Boulder Mountain into the upper portions of Lake Powell. Last Chance Creek and Wahweap Creek are the principal tributaries off the Kaiparowits Plateau, flowing into the main body of Lake Powell. The Paria River-Kitchen Corral Wash system (including Hackberry Creek and Cottonwood Creek) extends from the Bryce Canyon-Bryce Valley area, terminating below Glen Canyon Dam near Lee's Ferry. On the extreme west side of the Monument, Johnson Wash flows southward into Kanab Creek and eventually into the Grand Canyon. The Monument contains about 2,500 miles of stream channels and washes. Less than 10 percent of these are perennial streams and primarily include the upper reaches of the Escalante River, the Paria River, and Last Chance Creek.

Ground water is present in most of the consolidated rocks within the Monument. Freethy (1997) suggests that the period of major recharge for these aquifers was prior to 10,000 years ago during the waning stages of the last glacial period. Five regional aquifers occur within the Monument (Figure 3.3). In descending order, these are: (1) the Mesaverde aquifer, including Straight Cliffs and Wahweap Formations; (2) the Dakota Formation aquifer; (3) the Morrison Formation aquifer; (4) the Entrada Formation aquifer; and (5) the Glen Canyon aquifer, including the Navajo, Kayenta, and Moenave (Wingate) Formations.

Figure 3.3 Regional Aquifers (After Freethey, 1997)



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The Glen Canyon aquifer is the thickest and most extensive of the principal aquifers. The rocks of the Glen Canyon aquifer are exposed in the Grand Staircase and in the Escalante Canyons regions of the Monument, but lie in the subsurface beneath the Kaiparowits Plateau to depths approaching 4,500 feet. The volume of water contained within the aquifer is estimated to be greater than 400,000,000 acre-feet (Freethy, 1997). In recharge areas of the Glen Canyon aquifer, or where water table conditions exist (unconfined parts of the aquifer), the water is generally fresh (< 1,000 mg/L total dissolved solids (TDS)) and of the type calcium, magnesium, bicarbonate. Where the Glen Canyon aquifer is confined, primarily beneath the Kaiparowits Plateau, ground water is generally slightly saline (1,000 to 3,000 mg/L TDS), and is sodium, sulfate-type. The lowest TDS-concentration in ground water occurs in the Glen Canyon aquifer (191 mg/L). The highest TDS-concentration in ground water occurs in the Mesaverde aquifer (5,920 mg/L). The lowest TDS-concentration in streams is in Boulder Creek (172 mg/L). The highest TDS-concentration in streams is in the Paria River (3,980 mg/L). The potentiometric surface within the Glen Canyon aquifer in areas near Lake Powell has risen as much as 357 feet due to the inundation by the lake (Blanchard, 1986).

Public Water Reserves were established by Executive Order of April 17, 1926. They were established to reserve for general public use all important springs and water holes on public lands, and to prevent monopolization of the public domain through control of these water sources. There are 248 public water reserves within the Monument (see Table 3.9).

Water resources research in the Monument has been limited to studies of historic and prehistoric flooding events (Webb, 1985) and assessments of ground-water aquifers in anticipation of coal development in the Kaiparowits Plateau (Blanchard, 1986). Several stream courses within the Monument are perennial, but most are ephemeral, experiencing periodic flooding during storm-runoff. Springs issue where canyons cut into the saturated zones of aquifers. The BLM is currently developing a water-quality monitoring program at 60 sites within the Monument, in conjunction with the Utah Division of Water Quality, to ensure that State and Federal standards will be met.

The Escalante River is located in the eastern portion of the Monument. This river system remains remote and largely unexplored from a scientific standpoint. A multi-year, interagency, interdisciplinary research project is being initiated with the goal of systematically collecting a variety of physical, biological, cultural, and social data on the Escalante watershed. This will cover the area from the headwaters on Dixie National Forest, through the Monument, and continue on to Glen Canyon National Recreation Area until it flows into Lake Powell. The knowledge gained from these efforts will provide a baseline of data for future research on the Escalante watershed. It will better enable land managers to make scientifically based decisions for future use within this ecosystem.

WATER-DEPENDENT RESOURCES AND CURRENT WATER USES

The Proclamation directed that the Monument Management Plan address the extent to which water is necessary for the proper care and management of the objects of the Monument, and the extent to which further action may be necessary pursuant to Federal or State law to ensure the availability of water.

This section describes the extent to which Monument resources are water-dependent, and describes current water uses. Options for ensuring the availability of water under Federal and State law are discussed in Chapter 2, Management Common to all Alternatives.

WATER-DEPENDENT RESOURCES

The Monument is vast and arid, but its "scarce and scattered water sources" are important to a number of Monument resources. Although water is scarce within the Monument, its effects are pervasive. The landscape has been formed by water, its rock laid down in shallow seas or deposited by ancient streams and dune fields. Water continues to sculpt that rock, forming the canyons, arches, mesas and washes that characterize the area today, perhaps most notably in the upper Escalante Canyons, the Escalante Natural Bridge, and Grosvenor Arch. Upper and Lower Calf Creek Falls, Deer Creek, and the Paria and Escalante Rivers are well known hydrologic features of the Monument. The largest of occurrent peak flows are the most crucial components of the hydrologic cycle to these features.

From the geologic perspective, the primary resources are the geologic processes that formed the unique landforms that now exist: the downcutting process of canyon formation, arch and bridge development, and the development of soils. The continued availability of water, including seasonal and flood flows, is necessary to preserve these formative processes and geological resources. It will be necessary to ensure that instream flows and groundwater levels, and their seasonality, are maintained, and to ensure that the flow levels and seasonality of seeps and springs are maintained, in order to protect the geological processes of the Monument.

Water is crucial to most biological resources within the Monument, including the communities of plants and animals associated with hanging gardens, seeps, springs, tinajas, and with ephemeral, intermittent, and perennial streams and ponds. The Monument contains an abundance of unique, isolated communities directly related to its scattered water sources, which constitute oases in the vast and arid landscape. These communities have provided refuge for many ancient plant species, and undoubtedly contribute to the high degree of plant endemism found within the Monument.

Hanging gardens occur where ground water surfaces along canyon walls from perched water or in bedrock fractures. Often containing a wide variety of unique plant and insect species, hanging gardens are characteristic of flat-lying strata with deeply incised canyons typical of the Colorado Plateau.

Two threatened, one endangered, and nine sensitive plant species are known within the Monument. Water requirements of these species vary, but all are dependent on adequate water. One of the threatened species, the Ute ladies'-tresses, an orchid, (*Spiranthes diluvialis*) is dependent on the unimpeded natural water flows and stream channel changes that occur in the watershed in which it grows (Appendix 12).

The Monument provides habitat for over 400 vertebrate and 1,000 invertebrate animal species, most of which depend on water sources within the Monument (Appendix 15). Five species known to occur within the Monument are listed as threatened or endangered species: the southwestern willow flycatcher (*Empidonax traillii extimus*); the American peregrine falcon (*Falco peregrinus anatum*); the bald eagle (*Haliaeetus leucocephalus*); the Mexican spotted owl (*Strix occidentalis lucida*); and the California condor (*Gymnogyps californianus*). The southwestern willow flycatcher (*Empidonax trailli extimus*) is a small bird that occupies riparian zones in the southwest. There have been confirmed sightings of the flycatcher in the Paria River riparian corridor and in the upper Escalante River riparian corridor above the Highway 12 bridge. The bald eagle feeds in riparian areas. The peregrine falcon and the Mexican spotted owl nest and feed in riparian areas. The California condor, an experimental "10e" species, is the only one of the listed species known to occur in the Monument which is not generally associated with riparian areas.

In addition to the five threatened or endangered species known to occur within the Monument, the endangered Kanab ambersnail *(Oxyloma haydeni kanabensis)* may occur within the Monument where suitable habitat exists. The Colorado squawfish *(Ptychocheilus lucius)* and the razorback sucker *(Xyrauchen texanus)*, are endangered species which occur in Lake Powell. Although it is unlikely that either occur within the Monument, actions within the Monument which affect water flowing into Lake Powell could affect them. All of these species are associated with water sources and riparian areas.

The native fish of the Escalante River system, like the flannelmouth and bluehead sucker, normally have evolved with variations in flow regimes, high spring flows and low fall and winter flows. These variations in flows allow for the movement of sediment, building backwaters, eddies and other micro habitats for all aquatic species.

Although they comprise only one percent of the Monument, riparian areas are the most productive and diverse ecological zones in the Monument. Riparian systems include the transition zone between permanently saturated soils and upland areas and reflect physical and vegetative conditions of permanent surface or subsurface water. Wildlife in general, including neotropical birds, concentrate around the riparian areas within the Monument, because of the vegetation and associated organisms these areas support. Natural base stream flows are required in order to maintain active riparian systems. Base flows can be reduced by surface-water impoundments, disruptions to ground-water flow, and invasions of hydrophillic vegetation such as tamarisk.

Water is integral to the historic sites and many of the archeological sites within the Monument, because the presence of water draws people, ancient and modern, to settle and build near it. The location of the historic Paria townsite and virtually all of the historic line shacks and cabins in the Monument were determined by proximity of water. The same is true for archeological sites throughout the Escalante drainage. Such cultural sites benefit from the availability of the water sources that explain their presence, that form their settings and provide their context.

The Monument was established to protect an unspoiled natural area. Protection of Monument resources requires the protection of the natural systems that support them, and water is integral to those systems. In the arid environment of the Monument, natural systems have developed within the constraints of limiting factors, water being chief among them. Significant reductions in available water are likely to result in reductions to or eliminations of natural communities and systems. The continued availability of water is, therefore, essential to the maintenance of those systems. The following section discusses the specific issues involved with each of the four individual drainage areas within the Monument.

CURRENT WATER USES

This section addresses current water uses and issues relative to each watershed or watershed group. These watersheds or watershed groups are: the Escalante River drainage; the "Kaiparowits Composite Drainage Area" comprised of eight smaller separate drainages (all of which have their headwaters within the Monument and drain south into Lake Powell); the Paria River drainage; and the "Johnson Composite Drainage Area" comprised of three smaller separate drainages.

Escalante River Drainage

This drainage is the largest in the Monument. The towns of Escalante and Boulder, where most of the existing appropriated water rights are found in this basin, lie fairly high in the drainage. With the exception of the private lands in and around these communities and a few scattered Utah School and Institutional Trust Lands, the Escalante River and all of its tributaries lie within Federal property, either within the Monument, or within the Dixie

National Forest, Capitol Reef National Park, or Glen Canyon National Recreation Area (GCNRA). When the Escalante River leaves the Monument, it flows through a portion of the GCNRA and into Lake Powell.

The Escalante is one of the few perennial streams in the Monument, and clearly the largest. Within the Monument, the mainstem of the river is perennial below the town of Escalante, as are several tributaries that join the mainstem from the north, including Sand, Calf, Boulder and Deer Creeks. During drier years, The Gulch, including Steep Creek may become intermittent. The only other perennial stream within the Escalante River drainage inside the Monument is the last mile or so of Harris Wash before the stream leaves the Monument and passes into the GCNRA. Most if not all of the perennial portion of this stream within the Monument also lies within Utah School and Institutional Trust Lands. While only limited stream gauge data is available on other tributaries to the Escalante River, it is not believed that any of them are perennially flowing streams.

The United States Geological Survey (USGS) maintained a gauge at the lower end of the Escalante River for five years before the site was inundated by the waters of Lake Powell. During that period of record (1950 to 1955), this gauge recorded a mean flow of 82.2 cubic feet per second (cfs), which included the depletions from the private and municipal water rights in the vicinities of the towns of Escalante and Boulder. Boulder Creek's mean flow alone is approximately 23 cfs for its period of record (1950 to 1955). It is estimated that the existing water rights are depleting only a small percentage of the average base flow in the Escalante River, and take only a negligible amount from the peak flows during flash floods and other such runoff events, which are the critical flows for the canyon formation process. The large surface area of the Escalante River drainage, almost all of which is Federal land under the administrative jurisdiction of the BLM, the National Park Service, or the Forest Service, will likely ensure that runoff peak flows will continue their contributions to the Monument's water-dependent resources.

Some storage of water takes place upstream of the Monument. The New Escalante Irrigation Company has a small reservoir (200-275 acre feet capacity) on North Creek and another storage reservoir (off-stream) at the lower end of Wide Hollow which stores water from North Creek, Birch Creek, and Upper Valley Creek for agricultural use. This reservoir, which originally had a capacity of 2,400 acre feet, has silted in to the point that it now holds only about 1,100 acre feet. The irrigation company is planning a new reservoir just northwest of the existing reservoir to replace the lost capacity and expand storage capacity to about 7,000 acre feet (verbal communication Kim Keele, New Escalante Irrigation Company, 9/10/98). Water is presently conveyed via a canal diverting water from North, Birch, and Upper Valley Creeks and stored in the existing Wide Hollow reservoir. Pine Creek Irrigation Company has a diversion on Pine Creek upstream from where the Creek runs along the Monument boundary (repeatedly passing in and out of the boundary) before Pine Creek reaches the Escalante River. The water from this diversion is delivered directly into a pressurized sprinkler system to irrigate farmlands north and northeast of the town of Escalante. When in use, this diversion reportedly dries up the remaining reaches of Pine Creek.

The culinary system for the town of Escalante (population about 1,000) consists of a spring collection system and one well. The town also has a million gallon storage tank. Given the Utah State Health Department's requirements for a production capacity of 1,600 gallons/day (0.0025 cfs) per connection, the town's collection system can provide 1,020 connections and storage for 625 connections. Approximately 25 percent of the existing reservoir capacity is used for irrigation in the town of Escalante. (The town irrigation system has a back up system which diverts water from the culinary supply system when water in Wide Hollow reservoir is depleted) (verbal communication, D. Liston, New Escalante Irrigation Company, 8/6/97).

All these existing depletions in the Escalante River drainage upstream from the Monument result from such direct diversions of surface water and from groundwater withdrawals from wells. Because of this, larger flows that result from precipitation events such as snowmelt runoff and summer monsoonal thunderstorms (the flows that are the most significant to the Monument in terms of channel maintenance, ongoing erosional processes, and canyon formation) are almost unaffected by current diversion levels upstream.

There are 1,313 water rights of record inside the Monument boundaries within the Escalante River watershed. Of these, 844 are owned by the BLM in support of its grazing permittees under the Taylor Grazing Act, 184 are owned by the Utah School and Institutional Trust Lands Administration , most in support of state grazing leases, two amounting to 527 acre feet are owned by the Utah Board of Water Resources, and 282 are owned by private individuals, companies, or municipalities, primarily fairly high in the watershed. The Utah Division of Parks and Recreation owns one water right within the Monument. Within the upper Escalante River Basin, which includes areas outside the Monument, some 1,563 water rights are held for private and municipal uses. The Utah Department of Natural Resources has not conducted a water budget analysis for the entire Escalante River drainage, but a general overview of the drainage suggests that total depletions to this system are approximately 5 percent of the average annual discharge.

In addition, within the Escalante River basin the BLM holds 94 Federal reserved water rights resulting from executive order public water reserves, most of which lie within the Monument. These water rights protect water at the springs and waterholes but not after it leaves the quarter-section within which the spring or water hole is located.

The Utah State Engineer has closed the area immediately around the town of Escalante to new appropriations of water, due to full appropriation levels of the streams in that locale; the balance of the watershed remains open to new appropriations, but only to small applications of 0.015 cfs or less, because it lies within the drainage area of the State subject to the interstate compacts affecting Utah's use of Colorado River water.

While there is some substantial water development of the Escalante River drainage upstream of the Monument, most of the base flow perennial water available to the Monument enters the Escalante River downstream thereof. This fact, together with the fact that peak flows resulting from snowmelt runoff and summer thunderstorms will continue to pass through the Monument virtually unimpeded due to the large percentage of the watershed within Federal ownership, and the further fact that the Utah State Engineer has closed portions of the basin to new appropriations and has placed limits of 0.015 cfs or less on new appropriations within the balance of the basin, suggests that the Monument's water resources are currently not experiencing adverse effects from the existing levels of development, and are not likely to do so in the foreseeable future.

Kaiparowits Composite Drainage Area

Lying generally south of the Escalante drainage, the Kaiparowits composite drainage consists of a topographic upland area characterized by numerous dry washes comprising ten principal watersheds. All ten of these relatively small drainages, when flowing, drain southward into Lake Powell after passing from the Monument into the GCNRA. These include Coyote Creek, Wahweap Creek, Nipple Creek, Warm Creek, Last Chance Creek, Croton Canyon, Little Valley Canyon, Rock Creek, Middle Rock Creek, and Dry Rock Creek.

The only perennial streams in this area are an approximately 8 mile reach of Last Chance

Creek (including the lowest 1 mile of one of its tributaries, Drip Tank Canyon) and a 1 mile stretch in the lower portion of Croton Canyon. Except during periods of high runoff, both of these streams dry up again (disappear into the sand) before they leave the Monument. This perennial water is assumed to result primarily from the surface expression of groundwater. There are no substantial records of water flows in this area; the USGS has maintained only a few scattered peak-flow meters to record the peak discharge of runoff events.

There is no private land within this portion of the Monument, although it does contain the normal pattern of school sections for Utah (four sections per township). There are only eight private or municipal water rights within the Monument in this area. Of the four sections of the Monument discussed here, the area containing these ten drainages is at present the least affected by private water development and likely to remain so. As in the Escalante drainage, precipitation events cause the dry washes to flow for brief periods, sometimes at very high levels.

There are 312 water rights of record inside the Monument boundaries within the combined watershed area described here as the Kaiparowits Composite. Of these, 249 are owned by the BLM in support of its grazing permittees under the Taylor Grazing Act, 55 are owned by SITLA, most in support of state grazing leases, and eight are owned by private individuals, companies, or municipalities, primarily fairly high in the watershed. The Utah Department of Natural Resources has never conducted a water budget analysis.

A large proportion of these water rights are clustered near the lower reaches of the Warm Creek and Wahweap Creek drainages. Most are quite small, but there is one cluster of existing private and municipal water rights in the Warm Creek drainage. Existing private and municipal water rights in the Wahweap Creek drainage are clearly minor in terms of effect on Monument resources. In addition, within the Kaiparowits Composite drainage area, the BLM holds 61 Federal reserved water rights resulting from executive order public water reserves. These water rights protect water at the springs and waterholes but not after it leaves the quarter-section within which the spring or water hole is located.

Of the entire Kaiparowits composite drainage area, only the extreme headwaters of Wahweap Creek on the south slope of Canaan Peak lie outside the Monument. Within this small area, no water rights have been filed, and the fact that this small portion of the drainage lies outside the Monument therefore does not pose a threat of adverse effects to Monument resources. This drainage area captures precipitation and passes it through; aside from small stockwatering ponds there are no storage reservoirs or other such facilities to restrain sporadic natural high flows.

Paria River Drainage

The Paria River is the second largest single drainage in the Monument, draining the Monument's west-central area into Arizona and eventually the Colorado River. The towns of Tropic, Cannonville, and Henrieville are located high in the drainage and together represent the area with the highest concentrations of private and municipal water rights.

Most of the mainstem of the Paria River within the Monument (about 30 river miles) flows on a perennial basis, but there are small reaches near the upper and lower extremities of the portion of the river within the Monument that are typically dry. The flowing reaches are fed by subsurface flows, springs and other groundwater expressions, and by bank storage after high flows. A reach of about 4 miles of Cottonwood Creek is also perennial in this drainage, but this creek normally is dry about 2 miles above its confluence with the Paria River. This portion of Cottonwood Creek is also kept flowing by springs and other surface expressions of groundwater. These gaining reaches of the

Paria River and Cottonwood Creek are followed by losing reaches, however, where they each become intermittent streams, flowing only subsequent to precipitation events.

Particularly during the irrigation seasons, the Paria is depleted seriously but still flowing when it reaches the northern Monument boundary. Shortly after entering the Monument, however, it commonly dries up for about 1 mile, then reappears and flows continuously until a point about 4 miles from where it again leaves the Monument boundaries. Outside the irrigation season, lesser upstream depletions result from the municipal uses of the towns of Tropic, Cannonville, and Henrieville. The USGS gauge "Paria River near Cannonville," with 20 years of record (1951-55 and 1959-74), is located inside the Monument in the intermittent reach of the river, below the stream emerging from Little Dry Valley but upstream of the river's confluence with Rock Springs Creek, and shows a mean daily flow of 9.08 cfs despite the intermittent character of the stream in this reach.

Little or no water storage occurs upstream of the Monument. All upstream depletions result from direct diversions of river water and from groundwater withdrawals from wells. Because of this, the larger flows resulting from snowmelt runoff and summer monsoonal thunderstorms (those flows which are the most significant to the Monument in terms of channel maintenance, ongoing erosional processes, and canyon formation) are almost unaffected by current diversion levels upstream.

There are 427 water rights of record inside the Monument boundaries within the Paria River watershed. Of these, 234 are owned by the BLM in support of its grazing permittees under the Taylor Grazing Act. Fifty-one are owned by SITLA, most in support of state grazing leases. One is owned by the Utah Board of Water Resources, and 141 are owned by private individuals, companies, or municipalities, primarily fairly high in the watershed. There are 584 existing private and municipal water rights in the Paria River basin lying outside the Monument boundary. In addition, within the Paria River basin the BLM holds 38 Federal reserved water rights resulting from executive order public water reserves. These water rights protect water at the springs and waterholes but not after it leaves the quarter-section within which the spring or water hole is located.

The Utah State Engineer has closed the Paria River drainage to new appropriations altogether in the area above the confluence with Henrieville Creek; the drainage below that point remains open to new appropriations, but only to small applications of 0.015 cfs or less.

There are a number of existing surface and groundwater diversions upstream of the Monument in this drainage, and water stored in Tropic Reservoir is in fact imported into the basin from the Sevier River drainage via the "Tropic Ditch." Because there are no sizable reservoirs or other storage facilities capturing high flows in the natural basin of the Paria River, snowmelt runoff and other large precipitation events continue to operate in their natural manner virtually unimpeded. Erosion and deposition processes continue with downcutting, backfilling, archbuilding and soil development. Upstream use has a more substantial impact on base flows near the northern boundary of the Monument within the Paria drainage. Henrieville Creek contributes to flow, and then 3 miles inside the Monument, the Paria River becomes perennial at the confluence with Rock Springs Creek.

The Utah Department of Natural Resources has never conducted a water budget analysis in the Paria basin, but from an overview it would appear that existing levels of depletions are unlikely to have any significant effect on Monument resources. The existing upstream depletions may be affecting riparian resources in this upper 3 miles, but the small size and small applicable area subject to possible future appropriations do not seem to indicate any threat of more than minor, incremental further depletions to base flows in this reach. The other water-related concern in the Paria River drainage relates to this stream as a high source of sediment- and salinity-loading to the Colorado River system, largely as a result of the geologic formations through which it passes (claystone and siltstone of the Chinle Formation and Tropic Shale).

Johnson Composite Drainage Area

Lying immediately to the west of the Paria River is an area characterized by several dry washes, all of which are contained within three drainage basins: Park Wash-Kitchen Corral Wash, Seaman Wash, and Johnson Wash. When flowing, Kitchen Corral Wash drains southward out of the Monument and eventually joins the Paria River in Utah before the Paria crosses into Arizona and joins the Colorado River below Lake Powell. Johnson Wash and Seaman Wash drain southward, eventually joining Kanab Creek in Arizona, and dropping into the Grand Canyon.

The only perennial stream in this area is an approximately 1 mile reach of Johnson Wash (Skutumpah Canyon) immediately inside the Monument as the stream crosses the boundary. Except during periods of high runoff, this water disappears into the ground approximately 1 mile inside the Monument. This perennial water is a continuation of flows from the tributaries in the northern-most portion of the drainage, in an area of mixed private, BLM, State, and Forest Service lands. There are sketchy records of water flows in this area. The northern tributaries of Thompson Creek and Skutumpah Creek have brief periods of record in 1976-77, a particularly dry period, showing respective mean daily flows of less than 1 cfs. Johnson Wash then enters the Monument boundary into an area where additional intermittent tributaries join it but where there are no additional flow records. It is thought that these tributary washes flow only during periods of precipitation. The Wash then leaves the Monument boundary. Seven miles downstream from the boundary the USGS maintained another gauge from 1994-1997 which showed a mean daily flow of 0.53 cfs, although this is apparently an intermittent reach of the stream.

There are scattered tracts of private land within this portion of the monument, as well as the normal pattern of school sections for Utah (four sections per township). Stream courses in the Johnson composite area are probably affected very little, either at present or likely in the foreseeable future, by private water development. As in the other watersheds of the Monument, precipitation events cause the dry washes to flow for brief periods, sometimes at very high levels.

There are 238 water rights of record inside the Monument boundaries within the combined watershed area described here as the Johnson composite. Of these, 159 are owned by the BLM in support of its grazing permittees under the Taylor Grazing Act, 16 are owned by SITLA. Most of the SITLA-owned water rights are in support of state grazing leases. Also, 63 are owned by private individuals, companies, or municipalities.

In addition to the above water rights located inside the Monument boundaries, there are a number of water rights taking water from the northern tributaries of Johnson Wash before the water enters the Monument. Of these, there are 67 existing private water rights, 19 BLM water rights for stockwatering, and 23 SITLA-owned water rights in support of grazing leases. The Utah Department of Natural Resources has not conducted a complete water budget analysis of this drainage system, but existing uses are not considered substantial.

Headwaters for The Seaman Wash drainage is entirely inside the Monument. Water rights in Seaman Wash consist of six private water rights and 17 owned by the BLM for stockwatering. Park Wash is a larger drainage lying almost entirely within the

Monument boundaries; that portion lying outside the Monument is a small piece of the drainage at the extreme northwest of the drainage. Some of the headwaters to Park Wash lie inside Bryce Canyon National Park and pass through only Dixie National Forest lands before entering the Monument. Other headwater streams in this portion of the Johnson composite drainage originate on National Forest lands and pass through an area of mixed private, State, and BLM lands before entering the Monument. There are 177 scattered private, State, and BLM water rights in this area upstream of the Monument.

In addition, within the Johnson composite area the BLM holds 52 Federal reserved water rights resulting from executive order public water reserves. These water rights protect water at springs and waterholes but not after it leaves the quarter-section within which the spring or water hole is located.

The depletions to Park Wash resulting from water rights upstream of the Monument are small, and are not felt to have significant effects on Monument resources dependent on base flows. They are thought to have virtually no effect on high flow runoff events. Upstream depletions in Johnson Wash, however, are clearly more significant in terms of their effect on that stream corridor. While the Monument encompasses most of the mid-stream tributaries on Johnson Wash, the upstream depletions are much higher as a percentage of annual flows, and the number of wells in this portion of the drainage basin upstream of the Monument are likely having an effect on the amount of surface water available in the stream inside the Monument. All three of the streams in this area are intermittent, however, and are usually dry even under natural conditions.

VISUAL RESOURCE MANAGEMENT

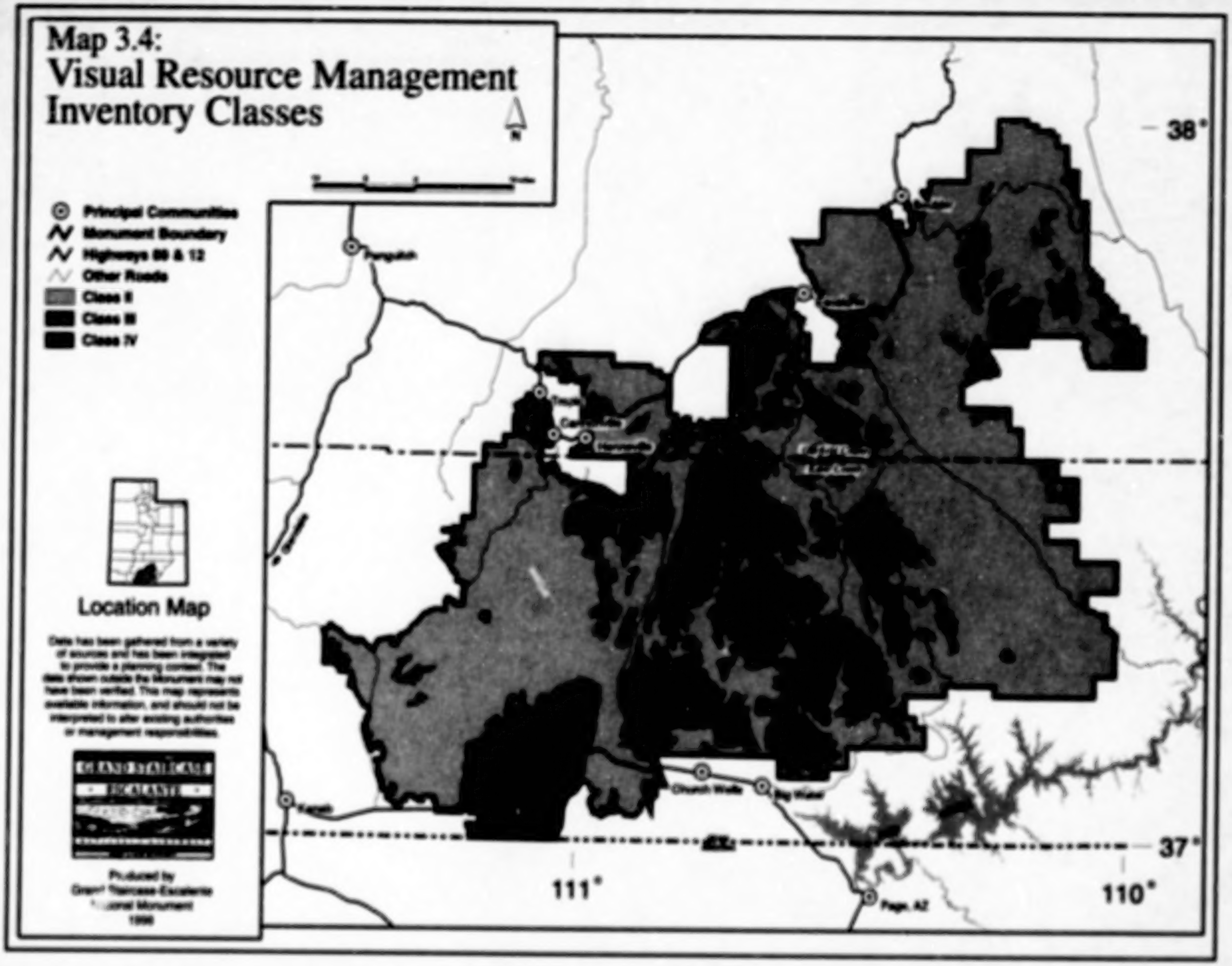
There are 1,275,900 acres categorized as Visual Class II, in which the objective is to retain the existing character of the landscape. Visual Class III areas, covering 561,300 acres, are areas in which the objective is to partially retain the existing character of the landscape. Finally, 35,300 acres are categorized as Visual Class IV, in which the objective is to provide for management activities which require major modification of the existing landscape. Appendix 8 describes the Visual Resource Management (VRM) class objectives, and Map 3.4 shows the VRM classes.

WILDERNESS STUDY AREAS, INSTANT STUDY AREAS, OUTSTANDING NATURAL AREAS

The Monument contains 16 WSAs, totaling approximately 880,600 acres, or about 52 percent of the BLM acres in the Monument. These areas are shown on Map 3.5 and listed in Appendix 9. These WSAs were identified in a 1978-80 inventory as having wilderness character and thus worthy of further study to determine their suitability for designation as part of the National Wilderness Preservation System. In 1990, the Utah Statewide Final Environmental Impact Statement analyzed the suitability of the WSAs for designation, and in 1991, the Utah Statewide Wilderness Study Report made suitability recommendations to Congress.

Existing WSAs in the Monument will be managed under the BLM's Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM Manual H-8550-1) until legislation takes effect to change its status. The major objective of the IMP is to manage lands under wilderness review in a manner that does not impair their suitability for designation as wilderness. In general, the only activities permissible under the IMP are temporary uses that create no new surface disturbance nor involve permanent placement of structures.

Map 3.4: Visual Resource Management Inventory Classes



Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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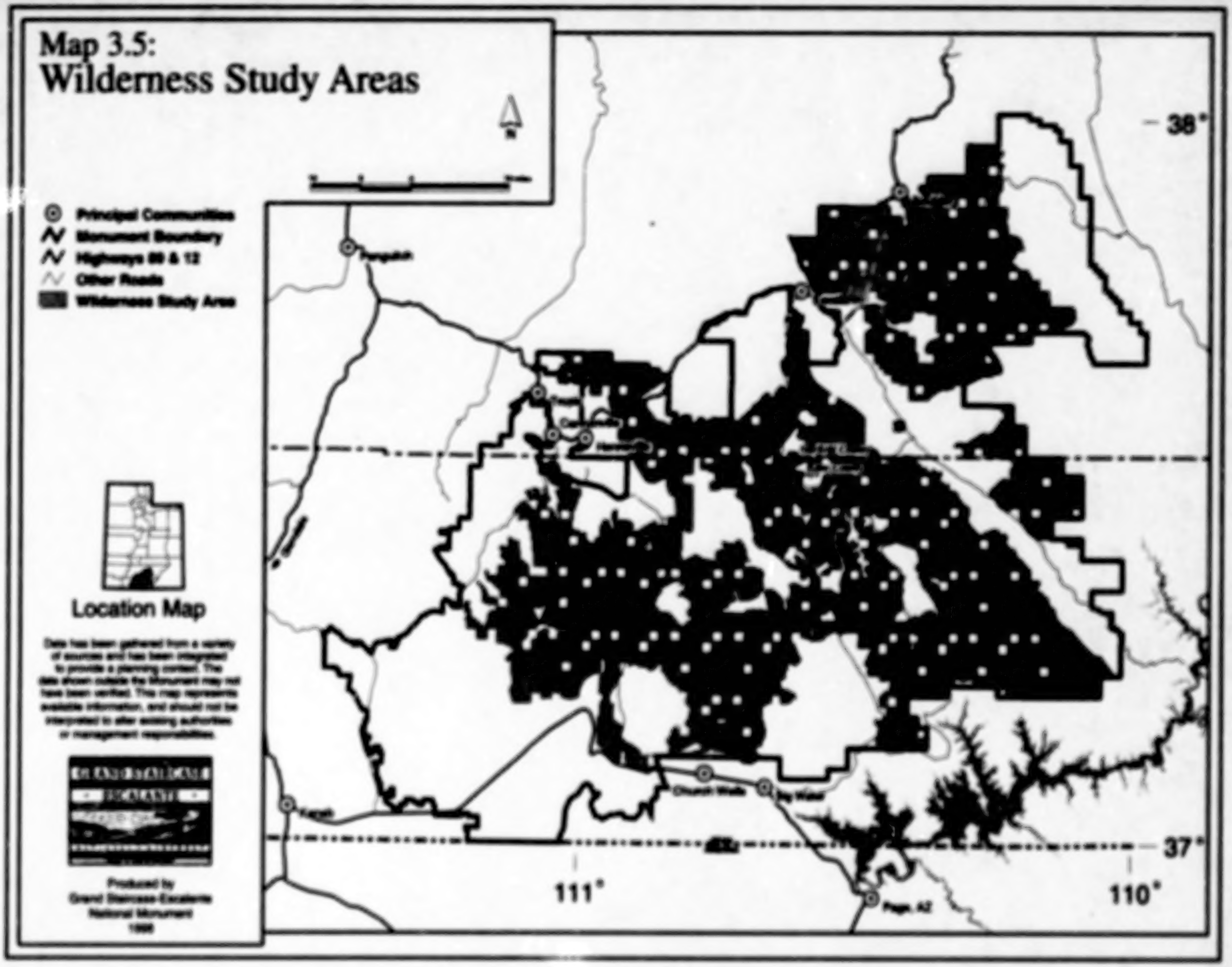
1998



Map 3.5: Wilderness Study Areas

Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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Temporary, non-disturbing activities, as well as activities governed by valid existing rights, may generally continue in WSAs.

Actions allowed under the IMP will also be subject to other BLM laws and policies that govern the use of public land.

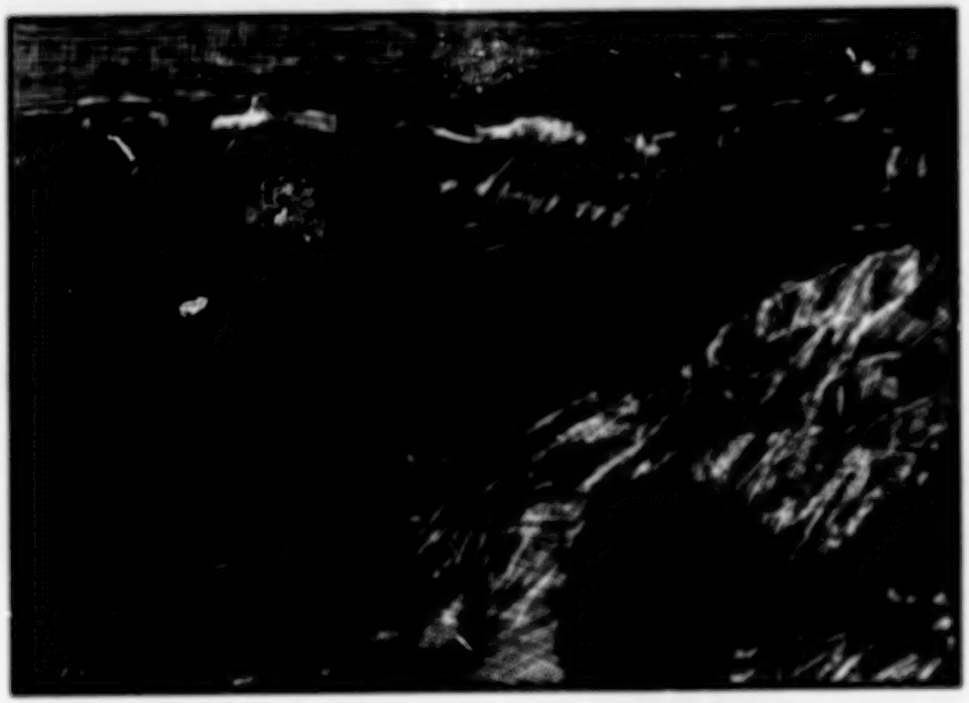
Outstanding Natural Areas (ONA) were created under the authority of the classification and Multiple Use Act (CMU) of 1964 (Appendix 18). Instant Study Areas (ISA) are lands that were previously classified as natural or primitive areas and were identified as ISAs under Section 603 of Federal Land Policy and Management Act (FLPMA). The ONAs became Instant Study Areas as part of the Wilderness Inventory process beginning in 1979. ISAs are equivalent to WSAs and are included in the acreage discussion of WSAs above.

WILD AND SCENIC RIVERS

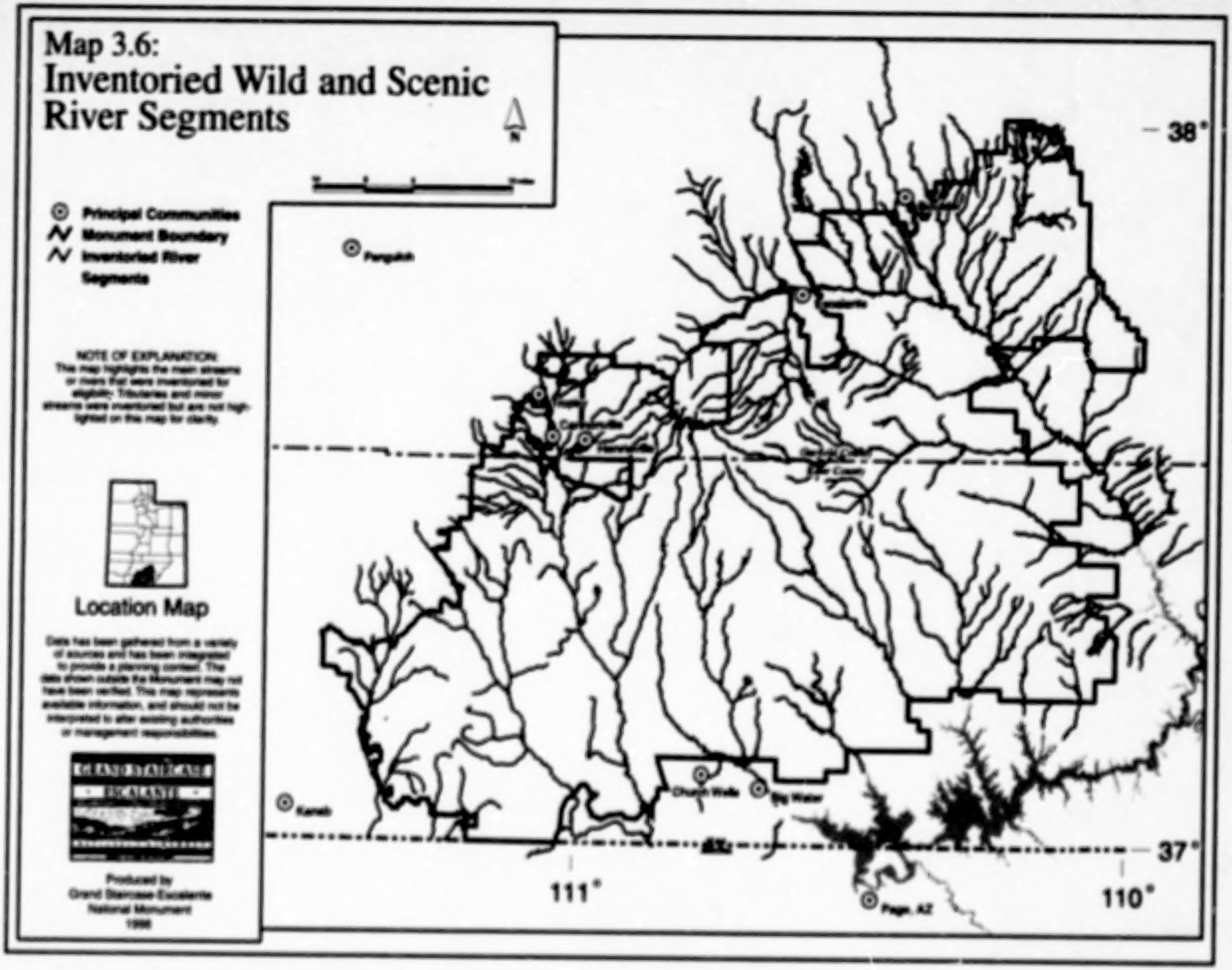
The Wild and Scenic Rivers Act of 1968, as amended, provides for protection of outstanding river resources. Section 5(d)(1) of the Wild and Scenic Rivers Act provides that wild and scenic river considerations be made during Federal agency planning. Either Congress, or the Secretary of the Interior, upon the nomination of the Governor of the State of Utah, may designate rivers as part of the National Wild and Scenic Rivers System.

BLM is responsible for making recommendations and completing appropriate environmental studies through the planning process. Pursuant to this mandate, the Monument planning team has completed an evaluation of river resources inside the Monument.

In 1994, BLM interdisciplinary teams gathered information regarding all river segments and watersheds in the Escalante and Kanab Resource Areas for consideration of river eligibility in the Escalante/Kanab Resource Management Plan (RMP). That RMP was not completed, but the Monument planning team has assessed the data gathered in 1994. In cooperation with the adjacent Federal agencies, the study area was expanded to include river segments that extended onto Dixie National Forest, Bryce Canyon National Park, and Glen Canyon National Recreation Area so that entire watersheds were evaluated. The water courses inventoried are shown on Map 3.6. The river segments that were found eligible are shown on Map 3.7 and Table 3.4. Potentially Eligible River Segments are described in Appendix 4.



Map 3.6: Inventoried Wild and Scenic River Segments



◎ Principal Communities
Monument Boundary
Inventoried River Segments

NOTE OF EXPLANATION:
The map highlights the main streams or rivers that were inventoried for eligibility. Tributaries and minor streams were inventoried but are not highlighted on this map for clarity.

Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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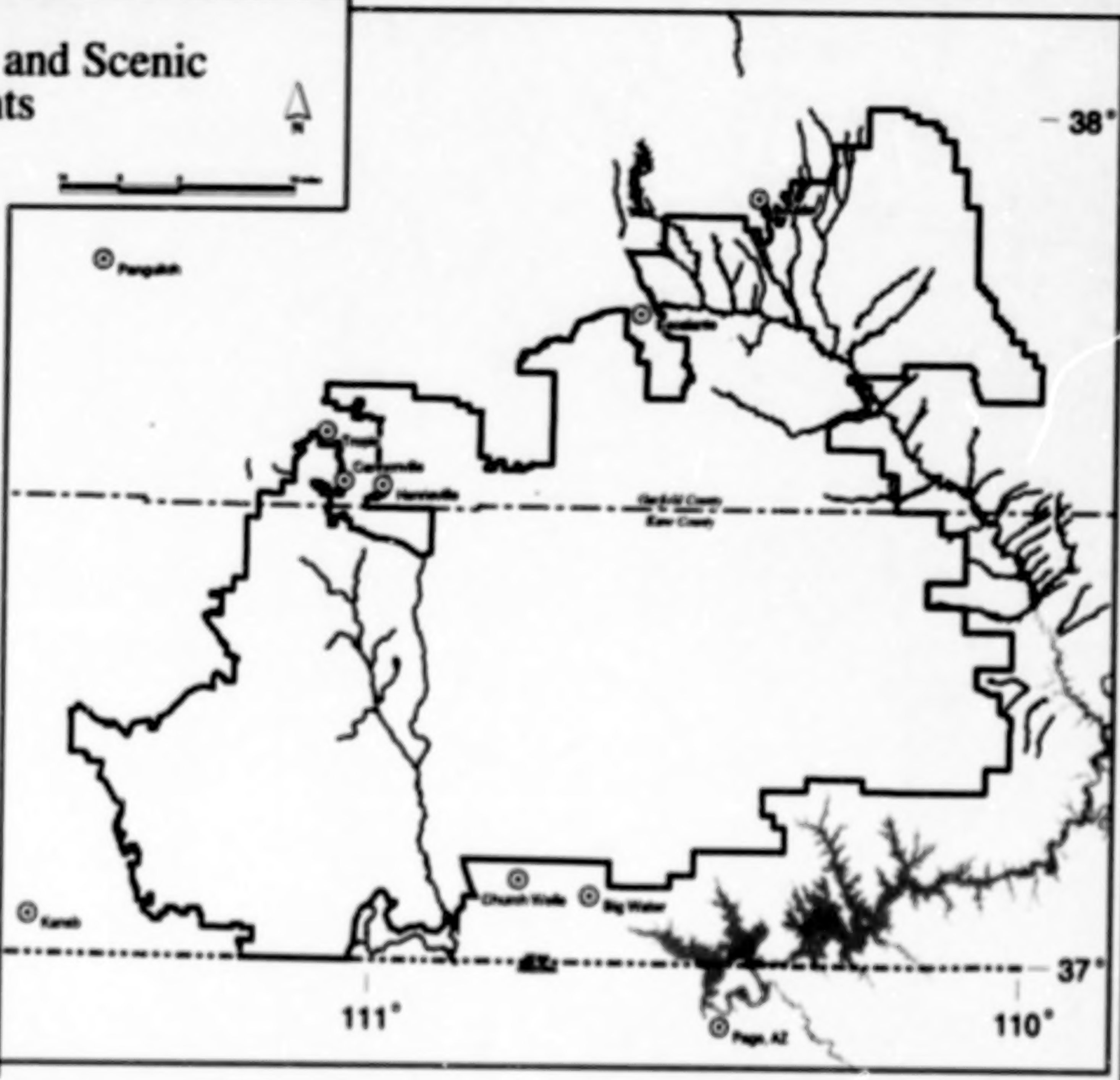
1998

Map 3.7:
Eligible Wild and Scenic River Segments

◎ Principal Communities
- Monument Boundary
- Eligible River Segments



Location Map

Data has been gathered from a variety of sources and has been integrated to provide a planning context. The data shown outside the Monument may not have been verified. This map represents available information, and should not be interpreted to alter existing authorities or management responsibilities.

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National Monument
1998

Table 3.4
Eligible River Segments

RIVER SEGMENT	SEGMENT DESCRIPTION	TENTATIVE CLASSIFICATION
Escalante River Basin		
Harris Wash	Tenmile Crossing (Hole-in-the-Rock Road) to Monument boundary	2.9 miles Scenic - Tenmile Crossing to Bighorn Wash 8.8 miles Wild - Bighorn Wash to unnamed road 2.8 miles Recreational - Road to west side of state section 1.2 miles wild - State section to Monument boundary
Lower Boulder Creek	Downstream side of State section to Escalante River	13.6 miles Wild
Dry Hollow Creek	Monument boundary to Lower Boulder Creek	4.3 miles Wild
Slickrock Canyon	Monument boundary to Deer Creek	2.8 miles Wild
Cottonwood Canyon	Monument boundary to Lower Deer Creek	4.4 miles Wild
Lower Deer Creek	Slickrock Canyon to Lower Boulder Creek	3.8 miles Recreational - Slickrock Canyon to Burr Trail 7 miles Wild - Burr Trail to Escalante River
The Gulch, Blackwater Canyon, Lamanite Arch Canyon, and Water Canyon	Monument boundary of the Gulch and the tributaries to Escalante River	11 miles Wild - Monument boundary to Burr Trail Road 0.6 miles Recreational - Along Burr Trail 13 miles Wild - Below Burr Trail 6.5 miles Wild - Black Water, Lamanite and Water Canyons
Steep Creek	Monument boundary to The Gulch including west tributary	8.9 miles Wild
Lower Horse Canyon	Outstanding Natural Area boundary to Escalante River	3.1 miles Wild
Wolverine Creek	Headwaters to top of road section Roaded section Bottom of road section to Lower Horse Canyon	2.3 miles Wild 1.3 miles Recreational 5.8 miles Wild
Little Death Hollow	Headwaters to top of road section Roaded section Bottom of road section to Escalante River	4.8 miles Wild 1.3 miles Recreational 8.7 miles Wild
Escalante River	Pine Creek confluence to Monument boundary	13.8 miles Wild - Pine Creek to Highway 12 1.1 miles Recreational - Highway 12 to east side of private land 19.2 Wild - Private land to Monument boundary

RIVER SEGMENT	SEGMENT DESCRIPTION	TENTATIVE CLASSIFICATION
Lower Sand Creek and Willow Patch Creek	Sweetwater Creek to Escalante River	13.2 miles Wild
Mamie Creek and west tributary	Headwaters on Dixie National Forest to Escalante River	9.2 miles Wild
Death Hollow Creek	Monument boundary to Mamie Creek	9.9 miles Wild
Calf Creek	Headwaters to Escalante River	3.5 miles Wild - Headwaters to Lower falls 2.9 miles Scenic - Lower falls to campground 1.5 miles Recreational - Campground to Escalante River
Phipps Wash and tributaries	Top to Escalante River	6 miles Wild
Unnamed Tributary (West of Calf Creek)	Top to Escalante River	2.6 miles Wild
Twentyfive Mile Wash	Rat Seep Hollow to Monument boundary and unnamed wash on north side.	11.1 miles Wild
Paria River Basin		
Paria River including Deer Creek Canyon, Snake Creek, Hogeye Creek, part of Kitchen Canyon, Starlight Canyon, and part of Cottonwood Creek	Little Dry Valley to downstream side of private property below Highway 89 (Paria segment extends into Henrieville Creek and Paria River Watersheds)	38.6 miles Recreational - Paria 5.1 miles Wild - Deer Creek 4.7 miles Wild - Snake 6.3 miles Wild - Hogeye 1.2 miles Wild - Kitchen 4.9 miles Wild - Starlight 2.9 miles Recreational - Cottonwood Creek
Bull Valley Gorge	Little Bull Valley to Sheep Creek	5.9 miles Wild
Lower Sheep Creek	Bull Valley Gorge to Paria River	1.3 miles Scenic
Hackberry Creek	Headwaters to Cottonwood Creek	20.1 miles Scenic
Buckskin Gulch	Wilderness boundary to Paria River, includes WirePass	18 miles Wild
Lower Paria River	From where river leaves private land to Arizona State line	3.3 miles Recreational - Private land to wilderness boundary 4.9 miles Wild - Segment in wilderness

COMMUNITIES AND ECONOMICS

Federal land management policy has played a major role in the development and stability of communities near the Monument. The 19th century view that public lands were to be privatized has evolved into the current policy that the public lands are to be retained and managed in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air, water, and archaeological resources. This shift in policy has affected how communities achieve economic and social stability. Earlier utilization of public lands focused on natural resource extraction (including livestock grazing and mining), and has evolved into a recognition of aesthetic and scientific values (including recreation and research).

The designation of the Monument has given a new emphasis to the need for current county and community plans. Virtually every gateway community, as well as Kane and Garfield Counties, are proceeding with their own plan amendment or update to address the impacts of Monument designation. BLM has been coordinating with these local governments and providing financial assistance for these efforts.

The present populations of both counties can be characterized relative to the State as being small, sparsely distributed, increasing slowly, and relatively old. As of 1998, approximately 12,000 people live in the area. Both counties have among the lowest populations per square mile of any of the counties in Utah. The largest cities in the area are Kanab (4,400); Panguitch (1,500); and Escalante (1,000) (Appendix 19).

Population growth in the counties has generally been lower than the State average. In Garfield County, immigration has occurred in five of the past ten years. Kane County's population has been increasing at a faster rate than in Garfield County and migration has occurred in only two of the past ten years (Appendix 19).

The populations in both counties are among the oldest in the State. For example, the median age in Garfield County of 31.8 years is the sixth highest in the State, while Kane County is the eighth highest with a median age of 30.5.

These unique demographic characteristics are closely associated with the economic realities faced by both counties. The populations are small because there are relatively few employment opportunities. The populations are relatively old and migration is common because many of those aging into the labor force must leave to find work (Appendix 19).

Performance of the economies in Kane and Garfield County can be characterized as cyclical and sluggish compared to the vibrant performance of the State's overall economy in recent years. Both counties struggle with unemployment rates higher than the State average, per capita personal income lower than the state average, and a lack of employment diversity. For example, unemployment in Garfield County is currently the second highest in the State at 8.3 percent. Unemployment rates have been in the double digits in five of the past ten years. Per capita income in Garfield County is estimated to be $16,900, just 83 percent of the State average. Kane County is faring better with an unemployment rate of 4.1 percent and per capita personal income of $19,900, closer to the State average of $20,400 (Appendix 19).

Many of the economic problems in both counties can be explained by a general lack of diversity in the economic structure. The area relies heavily on the economic performance of just four major industries: agriculture, government, timber, and tourism. The first three of these industries have been relatively constant or declining as a proportion of the total economy. While agriculture is an important economic resource to both counties, employment in agriculture has remained level, and at times has declined for many years. Employment in the timber industry has been cyclical and declining as sawmills have downsized and closed. Employment in local, state, and Federal government has been increasing, but slowly. It is only in the tourism industry that employment growth has been sustained. In fact, Garfield and Kane County's dependence on the tourism industry has steadily increased (see Appendix 19).

The Economic Research Service of the U.S. Department of Agriculture has developed a "rural topology" system, which characterizes non-metropolitan counties sharing important economic and policy traits. The system characterizes each county as part of a prevailing economic and policy type. Garfield County is described as "government dependent" because over 25 percent of total income is generated by the government sector. It is also described as a "Federal lands" policy-oriented county, due to the large proportion of Federal lands in the county. Kane County is described as "service dependent"; since over 50 percent of total income comes from service activities. It is also considered a "Federal lands" policy-oriented county (U.S. Economics and Statistics Administration, 1997) (Appendix 19).

Tourism currently provides 40 percent of total employment in Kane County and 60 percent in Garfield County. Since 1990, spending by travelers has increased 8 percent per year in Garfield County, and 10 percent in Kane County, as compared to 5.9 percent statewide (Utah Governor's Office of Planning and Budget, 1997) (Appendix 19).

Both counties have developed county-level economic development plans, and are part of the Southwestern Utah Economic Development District. These organizations have identified economic diversification as the primary need in both counties. Their major focus is on providing the physical infrastructure necessary to accommodate locally-grown businesses which complement the scenic surroundings. A secondary focus is providing adequate capital for local business owners (Five County Association of Governments 1996, 1998).

While both counties recognize that their economic bases are shifting toward an "amenity" base, where major economic growth is centered on activities which capitalize on the scenic resources of surrounding public lands, they are also committed to fostering a diversified economic base which allows for compatible business development in every sector. They are especially interested in light manufacturing, which adds value to local natural and human resources (Garfield County, 1995; Kane County, 1993; Hecox, 1996).

VISITOR USE

The Monument is part of a larger multi-ownership complex which includes adjacent National Forest, National Parks, Bureau of Land Management lands, Utah State Parks, and the infrastructure of tourist services and facilities in the adjacent communities. The Monument is outstanding among America's last great places where solitude, unconfined experiences, and a sense of adventure still exist.

Visitor use in the area has been increasing steadily. Since 1981, visitation has increased almost three-fold at adjacent Bryce Canyon National Park and nearly doubled in Capitol Reef National Park (Utah Governor's Office of Planning and Budget, 1997). Visitation has doubled in the Escalante Canyons Areas. Visitor use peaks in April and May, and again in September and October.

The visitation figures in Table 3.5 were primarily obtained from the Recreation Management Information System (RMIS). Figures are provided to this system by resource area staff on a yearly basis. The 1980 and 1985 figures were obtained from a draft recreation activity management plan for the Escalante Canyons in 1990.

Table 3.5
RMIS Visitation Figures

Year	Number of Visitors to Escalante Canyons	Number of Visitors to Kaiparowits Plateau	Number of Visitors to Grand Staircase
1980	11,600	Unknown	Unknown
1985	35,200	Unknown	Unknown
1994	373,200	Unknown	23,800
1995	384,800	Unknown	22,600
1996	456,400	Unknown	32,500
1997	659,500	3,700	42,000

While the figures in Table 3.5 are estimates based on road counters, trail registers and patrols, the Escalante Interagency Visitor Center reflects the most accurate visitor counts in the Monument (see Table 3.6). However, an informal interview conducted by Oregon State University students in 1997 found that only 40 out of 170 contacts stopped at the center.

The **Escalante Canyons** are world renowned for canyon backpacking and hiking opportunities. The quantity and variety of canyons, their accessibility, and water availability makes this area distinctive from other canyon areas in the Southwest. Many groups and individuals have been hiking in this area for over 30 years. Organizations include universities, public schools, Boy Scouts, church groups, clubs, and environmental organizations. The canyons are also used by horseback riders.

Table 3.6
Visitation Figures

Escalante Interagency Visitor Center	
Year	Number of Visits
1992	5,000
1993	12,000
1994	14,000
1995	15,000
1996	16,000
1997	26,000

Also popular in the Escalante Canyons Region is Highway 12, one of the most Scenic Byways in the Nation, connecting Bryce Canyon National Park to the west with Capitol Reef National Park to the east. Burr Trail and Hole-in-the-Rock Road are State designated backways that are popular for scenic driving. The Circle Cliffs and Wolverine areas contain a network of abandoned mining roads which provide four-wheel-drive, all-terrain vehicle (ATV), and mountain biking opportunities. Visitor use in this area is currently low.

While BLM provides camping at two small developed areas, most visitors camp in remote dispersed primitive areas.

The **Kaiparowits** Region is largely a remote, rugged, hostile environment to most visitors. There is very little water available. Winters are cold and summers hot. As such, most of the visitor use occurs along Smoky Mountain Road, which is a four-wheel-drive road connecting Big Water to Escalante. While the land itself is harsh, views of Lake Powell, Navajo Mountain, and other distant landscapes are spectacular. Four-wheel-driving and equestrian use are the predominant activities.

Unique to this physiographic region is Fiftymile Mountain. It is a large flat-topped mesa with piñon pine and juniper forests, some aspen groves and springs, edged by the Straight Cliffs, and accessed only by three non-motorized trails. It is popular for deer hunters, horseback riders, and some hikers.

The **Grand Staircase** region is best known for the trophy hunting of the Paunsaugunt mule deer herd. Antler hunting is also a popular activity. As such, the extreme southwest portion of the Grand Staircase is punctuated with sandy roads, also making them popular for ATV use and four-wheel-driving.

Cottonwood Wash Road is a State designated backway which connects Bryce Valley (to the north) with Highway 89 (to the south). Geology is the predominant feature and is popular with visitors and educational groups. Grosvenor Arch and The Cockscomb can be seen along this route. Skutumpah Backway is a two-wheel-drive high clearance route that connects Cottonwood Wash Road and Johnson Canyon Road, and is used as an access route to the Paria/Hackberry area. ATV use is moderate along this route.

The Paria/Hackberry Canyons area is non-motorized and is utilized somewhat by hikers. The lower Paria Canyon, located outside of the Monument in the Paria Canyon/Vermilion Cliffs Wilderness, is more known to hikers and is therefore more popular. Horseback riding is popular through Paria Canyon.

The movie industry "discovered" the area around Kanab in the 1920s and has continued to produce movies and television programs in the region. The Paria movie set was built in the 1960s, but was abandoned and is now a popular recreation destination.

There are no developed campgrounds in the Grand Staircase or Kaiparowits regions. A developed picnic area is located at the Paria movie set and a parking area at Grosvenor Arch.

Special Recreation Management Areas (SRMAs) are areas that require greater recreation investment, where more intensive recreation management is needed, and where recreation is a principal management objective. The Canyons of the Escalante and Paria/Hackberry Canyons are currently identified as SRMAs (Appendix 3).

For visitors, probable combinations of recreation activity, setting, and experience are expressed as recreation opportunities. Existing recreation experience opportunities are mapped based on the physical, social, and managerial setting. The physical setting is defined by the absence or presence of human sights and sounds (remoteness criterion), the size of the area, and the amount of modification caused by human activity. The remoteness criterion is based on distance from roads or trails and whether the trails are motorized or non-motorized. The social setting reflects the levels and types of contacts between individuals or groups. The managerial setting reflects the kind and extent of management services and facilities provided to support recreation use and the restrictions placed on peoples' actions.

The Recreation Opportunity Spectrum (ROS) divides recreation opportunities into six classes. The six classes are: primitive (P), semi-primitive non-motorized (SPNM), semi-primitive motorized (SPM), roaded natural (RN), rural (R), and urban (U). Currently, 663,200 acres are categorized as primitive, 538,400 acres are categorized as semi-primitive non-motorized, 582,200 acres are categorized as semi-primitive motorized, 79,600 acres are categorized as roaded natural, and 11,500 acres are categorized as rural. Urban class experience opportunities, characterized by a highly modified environment, are not present in the Monument. Appendix 20 describes the ROS setting descriptions for classes present in the Monument.

In 1997, recreation fees were collected through concessionaire contracts and special recreation permits. A concessionaire, as part of a Forest Service contract, operated Calf Creek, Deer Creek, and Devils Garden recreation sites from April through September of 1997. There were 3,019 recreation use permits issued for these sites and $11,385 worth of in-kind services provided by the concessionaire. BLM is currently managing those sites.

In 1997, 53 special recreation permits were issued with a total revenue of $16,905, which is 3 percent of gross revenues. Commercial use comprises approximately 10 percent of the total recreation visits to the Monument. Special recreation permits increased in the Escalante Canyons from 11 in 1990 to 26 in 1994. Outfitter and guide permitted use areas are shown on Map 3.8. Table 3.7 includes a list of the numbers and types of outfitters operating in 1997.

Table 3.7
Outfitters Operating in 1997

Mountain Bicycle Outfitters	2
Backpacker (Overnight) Outfitters	22
Climbing Outfitter	1
Fishing Outfitters	2
Big Game Hunting Outfitters	10
Hiking/Walking (Day) Outfitters	5
Horseback Riding Outfitters	5
Llama Pack Trip Outfitter	1
Scenic Viewing Road Tours Outfitter	2
Viewing Cultural Sites Outfitter	1
Competitive event - the Outlaw Trail Ride	1

In addition, there have been over 50 new inquiries for commercial operations within the Monument. Interim policy, established in January of 1998, determined that new permits will only be issued for one time events that do not exceed 14 days, are not surface disturbing, and do not violate Monument resources. This will be in effect until the Monument Management Plan is completed. In addition, group size in Wilderness Study Areas is limited to 12 people, including guide(s), and no more than 12 pack animals.

Currently, a Memorandum of Understanding between BLM and Glen Canyon National Recreation Area provides for administration of recreation use within the Escalante River canyon system from the town of Escalante to Lake Powell. The purpose of this agreement is to coordinate and promote the effective management of use on the Escalante River canyon system.

VISITOR FACILITIES

For the following discussion, facilities are defined as any structures built to serve a particular purpose. There are no existing BLM facilities associated with the Monument that support field work, museum curation, or laboratory preparation and analysis of scientific materials.

Currently, the Monument has administrative offices located in Escalante and Kanab. Visitor information centers are co-located at these offices, and interpretive associations operate sales centers in them through cooperative agreements. The Paria Contact Station is a visitor information site, located east of Kanab on Highway 89. The Monument also has a visitor contact area inside the Anasazi State Park Visitor Center in Boulder, Utah.

In addition to visitor contact facilities, several other types of "developed" sites exist within the Monument. These include 2 small campgrounds (Calf Creek and Deer Creek), 4 historic sites, 3 picnic areas, 5 scenic overlooks along Highway 12, and 22 trailheads. There is also limited signing at intersections of main roads and at trailheads. For a detailed description of these facilities, refer to Appendix 21.

LAND USE PERMITS AND CLASSIFICATIONS

Agency policy has been for the BLM to allow most uses, as long as resources are not negatively impacted. This has usually required some kind of land use permit and review of the proposed use. The land use permits are monitored by BLM personnel for compliance with their terms and conditions. Most land use permits are issued under authorization of Title III of the Federal Land Policy and Management Act.

Another authority is the Recreation and Public Purposes (R&PP) Act. Lands classified under the R&PP Act are segregated under the public land laws, including the mining laws. This act authorizes the sale or lease of public lands for recreational or public purposes to state and local governments and to qualified nonprofit organizations. There are currently 2 R&PP leases within the Monument, totaling 17.5 acres.

RIGHTS-OF-WAY

The Rural Electrification Agency was created in 1935 and Garkane Power Association was organized soon after. By 1939, electric power was sent from the generating plant at Hatch to Ruby's Inn, Bryce Canyon National Park, Tropic, Cannonville, Henrieville, and Escalante. Electric power lines were not extended to Boulder until 1947, and on to Salt Gulch in 1953. Location of electric powerlines and other utility rights-of-way have historically been determined by ease of construction and accessibility.

There are numerous electric transmission and distribution lines within the Monument, as well as other rights-of-way (including telephone lines, pipelines, and irrigation ditches). There are no BLM-designated utility corridors within the Monument. Table 3.8 contains information on Rights-of-Way.

Table 3.8
Rights-of-Way

Number	Type	Miles/Acres
26	Electric powerlines	152.74 miles
2*	Power Substations	2.57 acres
7	Telephone Lines	32.69 miles
22	Pipelines	23.70 miles
1	Ditch	0.43 miles
1	Tunnel	1.05 miles
4**	Communication Sites	2.49 acres
1	Reservoir	3.15 acres
1	Memorial Site	5.00 acres
1	Storage Area	144.55 acres
4	Mineral Material Sites	270.61 acres
19	Unpaved Roads	30.19 miles
19***	Paved Roads	51.50 miles

*These substations are authorized under the same right-of-way grant as their associated powerlines, not under separate authorizations.
**Three of these rights-of-way are within the same communication site (Buckskin Mountain).
***These are different segments of four of the paved/hard surfaced roads in the Monument: Highway 89, Highway 12, Burr Trail, and Johnson Canyon Road.

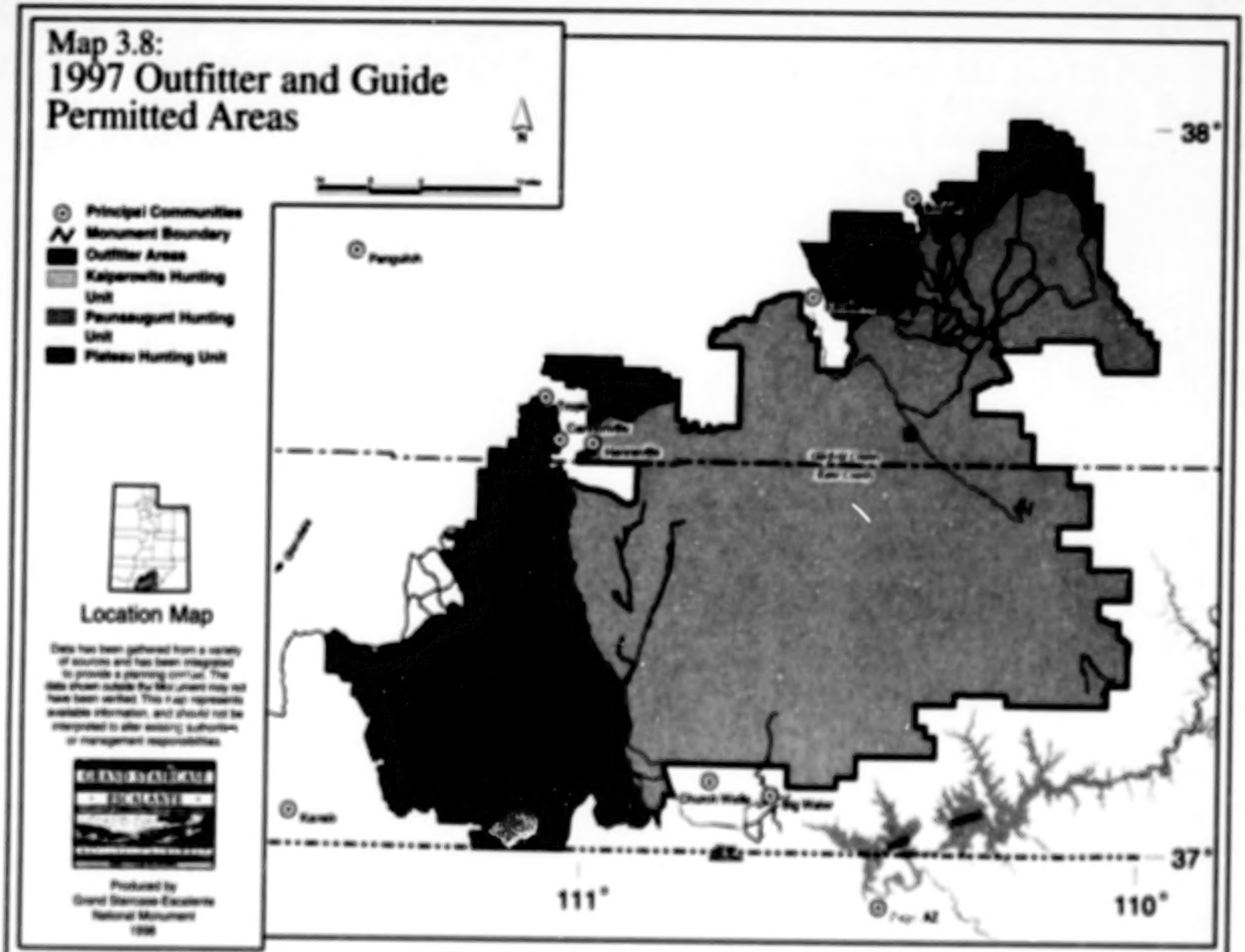
The Monument also includes site-specific non-linear rights-of-way which accommodate microwave and transmitter sites, small reservoirs, springs, recreation facilities, and mineral material sites. There are three communication sites within the Monument: Top-of-the-Rocks (located 7 miles southeast of Escalante), Buckskin Mountain (located 13 miles west of Church Wells), and Fiftymile Bench (located 38 miles south of Escalante).

BLM policy is to "authorize all rights-of-way uses on public and Federal lands at the discretion of the authorized officer..." (BLM Manual 2800.06). These are authorized under Title V of FLPMA. However, rights-of-way are generally not granted in areas where threatened or endangered species, important archaeological resources, wilderness study areas, or other critical resources would be adversely affected.

WITHDRAWALS

The area in which facilities are located is sometimes protected by a withdrawal. A withdrawal is a formal land designation which has the effect of reserving land for a certain use. Withdrawals remove certain public lands from the operation of one or more of the public land laws, excluding lands from settlement, sale, location, or entry, including entry under the General Mining Laws.

Map 3.8: 1997 Outfitter and Guide Permitted Areas



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Withdrawals remain in effect until specifically revoked.

Several types of withdrawals exist within the Monument. Table 3.9 summarizes all existing withdrawals within the Monument, as well as special classification areas.

Table 3.9
Withdrawals/Classifications

Number	Type	Acres
248	Public Water Reserves	12,035.23
10	Reclamation Withdrawals	17,496.00
3	Recreation Classifications	7,940.00
1	Withdrawal for FERC Project #2219	131.33
1	Withdrawal for FERC Project #2642	57.14
1	Wolverine Petrified Wood Area	1,520.00
1	Escalante Canyons ONA	1,160.00
1	Devils Garden ONA	640.00
1	N. Escalante Canyon ONA	5,800.00
1	The Gulch ONA	3,430.00
1	Phipps-Death Hollow ONA	34,300.00
1	Calf Creek Recreation Area	5,835.00
1	Deer Creek Recreation Area	640.00
1	Dance Hall Rock Historic Site	640.00

COAL

Coal beds contained in Cretaceous rocks of the Kaiparowits Plateau were first mined by settlers near Escalante in the late 1800s. Coal investigations were first reported by Gregory and Moore (1931). Energy companies became interested in development of Kaiparowits coal in the early 1960s as coal leases were obtained by 23 separate companies. Hundreds of coal test holes were drilled as plans were made to build a 5,000 megawatt coal-fired power plant on Fourmile Bench. The plans were scaled back in the early 1970s to a 3,000 megawatt plant and eventually dropped altogether because of economic and environmental concerns.

The Kaiparowits field (Map 3.9) is enclosed in Cretaceous rocks of the Straight Cliffs Formation. Hettinger and others (1996) estimated that the field contains 62 billion tons of original coal resource in-place in multiple coal horizons.

Two coal leaseholds, belonging to Pacificorp and Andalex Resources, Inc., cover about 54,000 acres within the Kaiparowits field. Pacificorp holds one coal lease consisting of approximately 18,000 acres, while the Andalex leasehold consists of 17 leases containing approximately 36,000 acres. The Pacificorp Lease was suspended in 1992 because of its inclusion in two Wilderness

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Study Areas. Under a recent decision of the Interior Board of Land Appeals, seven of the seventeen leases in the Andalex leasehold are currently suspended. Exchange discussions between Andalex and the Department of Interior and Pacificorp and the Department of Interior have occurred.

OIL AND GAS

Some 85 active Federal oil and gas leases within the Monument cover more than 136,000 acres of Federal land (Map 3.10). In addition, nearly 43,000 acres of lands administered by SITLA within the Monument boundary have been leased for oil and gas (Utah School and Institutional Trust Lands Administration, 1998). Although the geology of the Monument and surrounding region is favorable for the accumulation of oil and gas, the only commercial quantities of oil found to date are at the Upper Valley field. To date, 48 wildcat (exploratory) wells have been drilled within what are now the boundaries of the Monument. These wells have all been capped and abandoned. The most recent wildcat was completed in November of 1997 by Conoco on a SITLA lease.

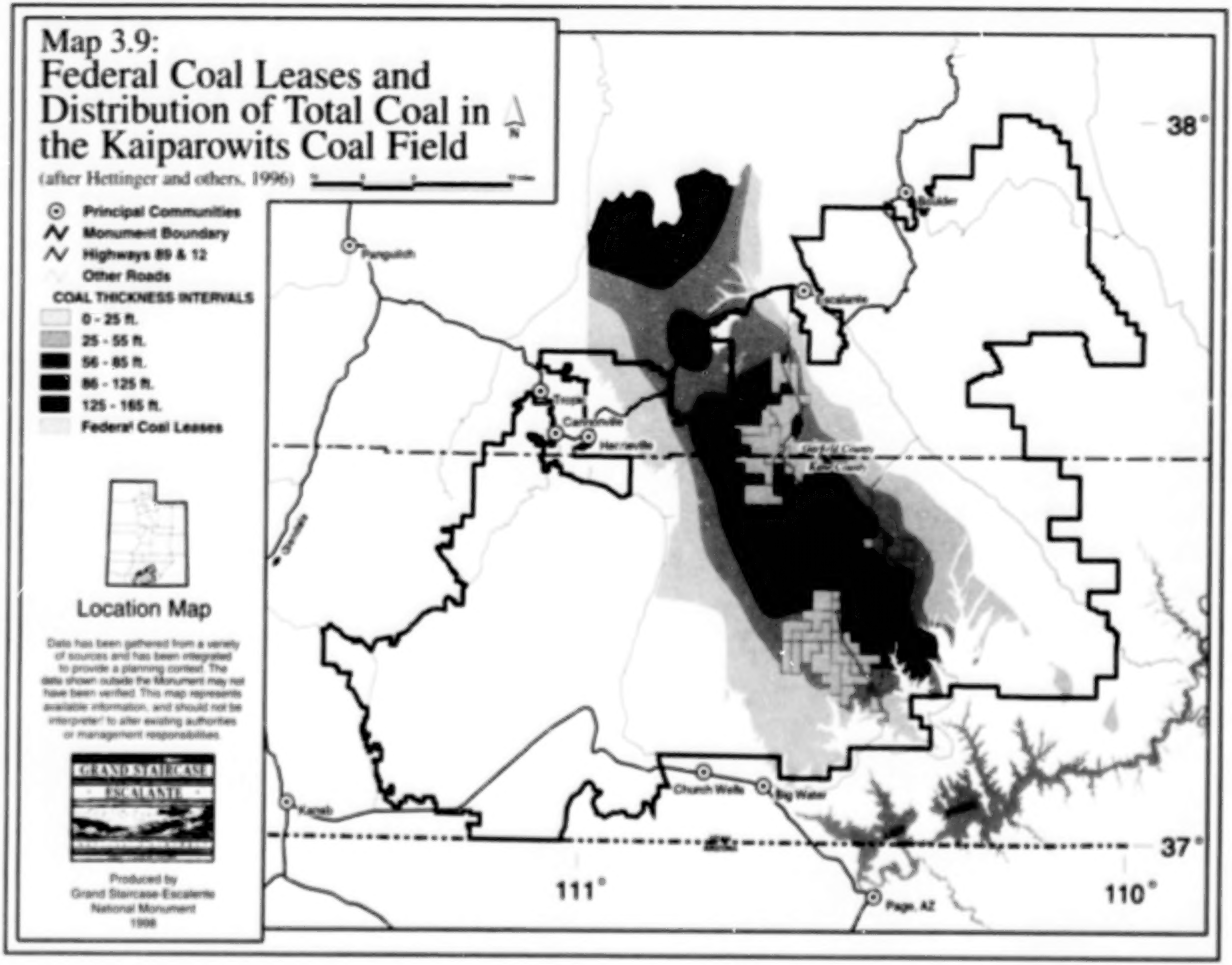
The Upper Valley oil field was discovered in 1964 by Tenneco, and has since produced nearly 26 million barrels of oil, mostly from the Permian Kaibab Limestone. Citation Oil & Gas Corporation is the current operator of 22 production wells and 11 water injection wells within the field. Five of the production wells and two of the injection wells are located within the Monument. Production from wells within the Monument represents about 27 percent of production from the total field. The oil accumulation at the Upper Valley field is unusual because it is displaced to the southwest flank of the Upper Valley anticline due to hydrodynamic drive in the Kaibab Formation (Sharp, 1978; Allin, 1993). The average monthly production from the field is about 20,000 barrels.

Conoco has completed its Reese Canyon State 32 (S32 T39S R5E) well, which was originally proposed to a total depth of 14,500 feet to test Cambrian and Precambrian rocks. The well was completed to a depth of 11,911 feet, reportedly encountering carbon dioxide (CO$_2$)within the Cambrian Tapeats Sandstone, and Muav Limestone (Utah Division of Oil, Gas, and Mining). Conoco's application was approved by the BLM to drill Reese Canyon Federal No. 2 (S5 T40S R5E), a proposed Cambrian and Precambrian test well with a projected total depth of 14,000 feet. After reviewing results of the Reese Canyon State 32 well, Conoco decided not to drill the Reese Canyon No. 2 well.

Conoco has submitted applications to the BLM to drill at several other locations in the Monument. The BLM has not, as yet, made a determination on these applications. The BLM is currently preparing an environmental assessment for one of the five applications for permit to drill (APD). The BLM is beginning the analysis of several possible drill sites in the Circle Cliffs area under the National Environmental Policy Act (NEPA). The minerals are State owned and the Federal surface is managed by the BLM. The BLM is processing the rights-of-way for the drill sites and is assessing the effects of the activities.

In the Circle Cliffs region of the Monument, remnants of a large, pre-existing oil field can be seen as solid bitumen that impregnates pore spaces of rocks in the Torrey and Moody Canyon Members of the Triassic Moenkopi Formation. These types of hydrocarbon deposits are sometimes referred to as "oil-impregnated rocks" or "tar sands" which are terms used to describe a sedimentary rock impregnated with a very heavy, viscous crude oil (bitumen) that cannot be extracted by conventional methods. The western flank of the deposit lies entirely within the Monument, while the eastern flank lies mostly within Capitol Reef National Park (Ritzma, 1979, 1980).

The U.S. Congress passed the Combined Hydrocarbon leasing Act (PL 97-78) in 1981, which provided for the combining of oil and gas leases with tar sand leases in certain specified areas containing the bulk of



Map 3.9: Federal Coal Leases and Distribution of Total Coal in the Kaiparowits Coal Field

(after Hettinger and others, 1996)

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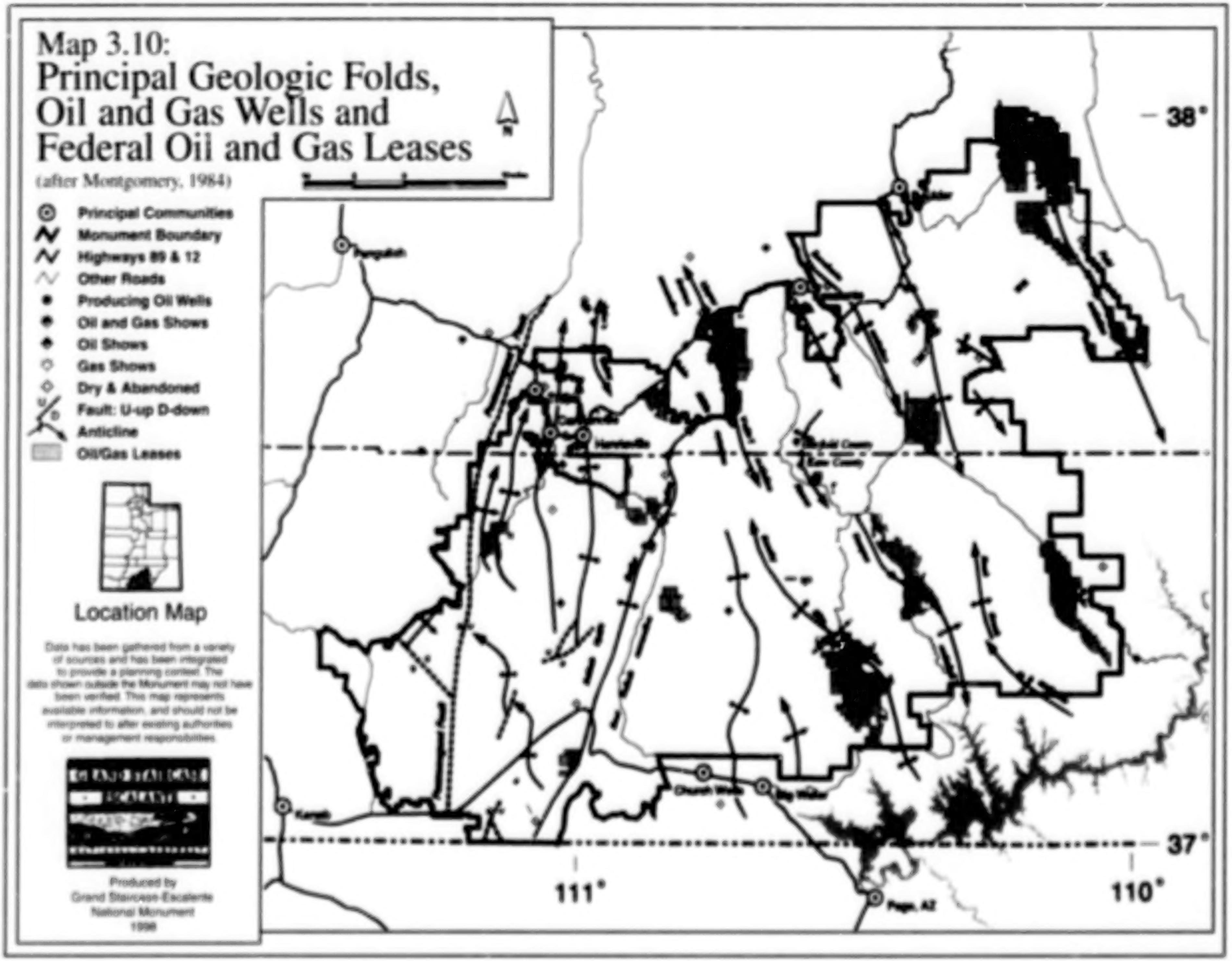

Map 3.10: Principal Geologic Folds, Oil and Gas Wells and Federal Oil and Gas Leases

(after Montgomery, 1984)

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Federally owned tar-sand. Subsequently, the Circle Cliffs area was designated as an STSA, or Special Tar Sand Area. Presently, there is one Combined Hydrocarbon Conversion Lease Application still pending in the Circle Cliffs area of the Monument. This application consists of 35 conventional oil and gas leases involving over 34,600 acres (Lopez, written communication, 12/22/97).

MINERALS

Various types of metallic-mineral deposits are known to be present in the Monument. Most of these are small and low-grade. Manganese was mined in the 1940s from the Petrified Forest Member of the Chinle Formation. This was taken from the Manganese King Mine on the north side of Kitchen Corral Wash. Total production was about 300 to 400 tons of ore containing 40 percent manganese (Buranek, 1945; Haven and Agry, 1949; Baker et.al., 1952; Doelling and Davis, 1989). Manganese is also found at the Van Hamet prospect located a few miles southeast of Escalante. The manganese occurs as lenticular pods and concretions in sandstone of the Jurassic Carmel Formation (Doelling, 1975).

Uranium associated with vanadium or copper is present within the Moenkopi, Chinle, and Morrison Formations. The Chinle and Moenkopi-hosted occurrences are in the extreme northeast portion of the Monument in the Circle Cliffs and in the southwestern part of the Monument near the Kaibab uplift and The Cockscomb. Morrison-hosted uranium occurrences are found along Fiftymile Bench. Mines that produced more than 200 pounds of uranium concentrate were developed within the Chinle Formation in the Circle Cliffs.

Anomalous gold values have been reported for Permian to Jurassic sedimentary rocks over much of southeastern Utah, particularly in the Chinle and Wingate Formations and in the Navajo Sandstone (Butler et.al., 1920; Gregory and Moore, 1931; and Phillips, 1985). Lawson (1913) reported several early unsuccessful attempts to mine the gold in the Chinle Formation at Paria by hydraulic methods.

Copper, often with associated lead, zinc, and silver, occurs in sedimentary host units in four separate areas within the Monument. The Rock Springs, Ridge Copper, and Bullet Shaft deposits are located south of Kodachrome Basin. These deposits lie on the east side of the north-plunging Kaibab anticline (Kaibab Uplift) and occur in the Jurassic Thousand Pockets Tongue of the Page Sandstone. Workings consist of surface pits, shallow shafts, and short adits. The Ridge Copper and Bullet Shaft were mined for copper but the Rock Spring deposit was mined mostly for lead (Doelling and Davis, 1989).

A number of heavy-mineral fossil placer deposits containing titanium and zirconium minerals are present in the John Henry Member of the Cretaceous Straight Cliffs Formation of the Kaiparowits Plateau. The deposits occur in a belt extending southward from Dave Canyon, which lies just south of Escalante, to Sunday Canyon, just west of Fiftymile Mountain. The deposits are fossil beach placers containing variable amounts of the minerals ilmenite, zircon, monazite, magnetite, rutile, and silicates (Dow and Batty, 1961).

There are 71 mining claims registered with the BLM inside the Monument boundary. These were established prior to Monument designation. The closed claim is under appeal. Presently, eight mining operations are permitted through the Utah Division of Oil, Gas and Mining (DOGM) (Burns, DOGM, written communication, 1/6/98). Six of these mining operations are on BLM administered lands and two are on Utah School and Institutional Trust Lands. One of the operations on Trust Lands is classified as "suspended." A proposed titanium-zirconium operation, permitted by DOGM but subject to BLM approval, has been disapproved because of Wilderness Study Area restrictions. Mining of gem-quality alabaster (a fine-grained form of gypsum) is permitted through DOGM at five locations within the Monument. One operation is for mining titanium-zirconium. Table 3.10 shows a listing of the DOGM-permitted operations.

Mineral materials generally include sand and gravel, clay, rip-rap, topsoil, and some forms of specialty stone. BLM regulations allow for the non-exclusive disposal of mineral materials by the establishment of community pits or common-use areas. The permittee is required to pay a proportional share of the reclamation costs, and the BLM does the reclamation. Free-use disposal of mineral materials is allowed to any Federal, or state agency, unit, or subdivision, including municipalities, or to non-profit organizations. There are 11 locations within the Monument where mineral materials have been excavated for public purposes.

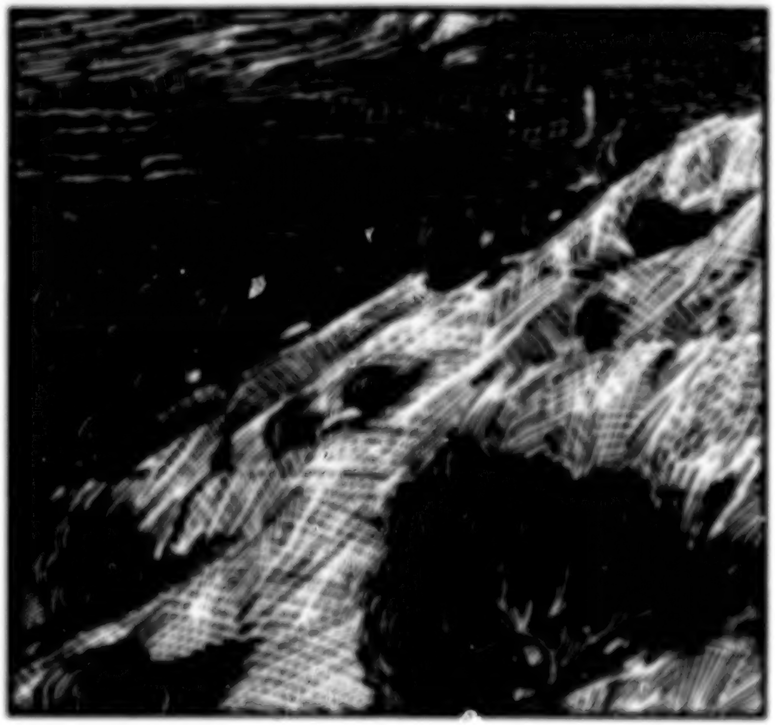
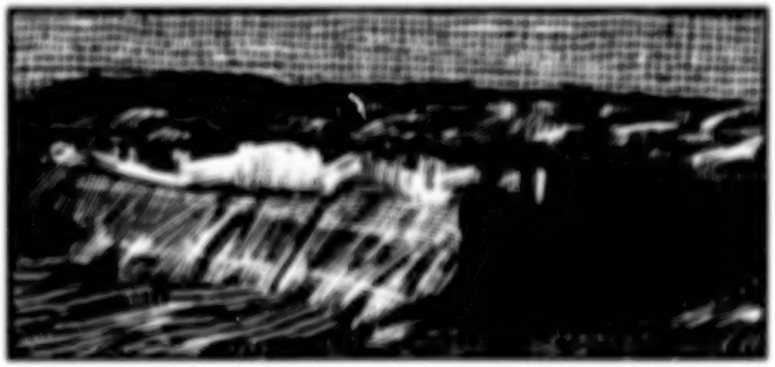


Table 3.10
Utah Division of Oil, Gas and Mining (DOGM) Permitted Operations

DOGM ID	Status	Name	Operator	Commodity	Township	Range	Section
S0170039	Active	Long Gulch II	Southwest Stone	alabaster/gypsum	36S	4E	6, 7
S0170041	Active[1]	Calf Canyon	3R Minerals	titanium-zirconium	36S	5E	17
S0250009	Suspended[2]	Tetla	Harry Greenwald	petrified wood	43S	4W	2
S0250015	Active	Big Dry Valley	Paul Larsen	alabaster/gypsum	38S	1W	19, 20
S0250016	Active	Butler Valley	Alpine Gem & Minerals	alabaster/gypsum	38S	1W	20, 27, 34, 35, 36
S0250017	Active	Stonehedge	Southwest Stone	alabaster/gypsum	39S	1W	1
S0250019	Active	Low Down 1	Southwest Stone	alabaster/gypsum	38S	1W	27, 28
S0250022	Active[2]	U-429	3R Minerals	titanium-zirconium	39S	5E	32

1 - DOGM permit classified as "active" but BLM has not approved plan of operations
2 - Located on Utah School and Institutional Trust Lands



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LIVESTOCK GRAZING

The history of livestock grazing in the area that now includes the Monument dates back to the 1860s. The number of cattle, sheep, and horses increased rapidly until the early 1900s. During this period, livestock grazing became a regulated and permitted activity on National Forests. Non-forest Federal land was treated as a "commons" in which those who moved their stock onto the range first each season secured the use of new forage growth. Stock from across the region were brought in to graze during the winter months, and many animals were left on the range year-round. During this period of unregulated use, rangeland resources and ecological conditions experienced significant harm from overgrazing. Overgrazing resulted in changes to vegetation communities, especially at lower elevations that were used for winter grazing. Control of the winter ranges did not occur until 1934 with the passage of the Taylor Grazing Act. During the following years, regulations pertaining to operators, allotments, kind and number of livestock, and season-of-use were established on public land.

In 1946 the Bureau of Land Management was established. During the late 1950s and early 1960s, range surveys were completed to determine the capacity of the land for grazing. Following these surveys, decisions on forage were adjudicated and livestock numbers on most allotments were reduced. A Federal court agreement on April 11, 1975 required the BLM to prepare Grazing Environmental Impact Statements on public grazing lands over a ten-year period. To comply with this agreement, the Kanab/Escalante Grazing Environmental Impact Statement was prepared in 1981 and adjustments in number and season of use occurred using this data. Grazing use within the region has significantly decreased from the peak in the early part of this century.

The Proclamation establishing the Monument states that "existing grazing use shall continue to be governed by applicable laws and regulations other than the proclamation." Livestock grazing is managed under the regulations contained within 43 CFR 4100, which provides uniform guidance for administration on the public lands (exclusive of Alaska). BLM instruction memos, information bulletins, and handbooks provide additional guidance on implementation of the grazing regulations. The current range management direction for the Monument is contained in the Interim Guidance issued by the BLM. This guidance states that livestock grazing within the Monument is permitted, pursuant to the terms of existing permits and leases. Utah BLM has adopted Standards and Guidelines for Rangeland Health that are to be applied to all BLM rangeland management decisions in Utah including the Monument, pursuant to 43 CFR 1600 and 43 CFR 4180. These Standards and Guidelines were adopted in 1997 in order to carry out the Fundamentals of Rangeland Health, developed by the Secretary of the Interior on February 22, 1995 (Refer to Appendix 7).

Livestock use is permitted across the Monument at different times and seasons throughout the year. However, this use does not occur everywhere in the Monument or necessarily in the same areas every year. Season-of-use is largely determined by elevation. Generally, the lower elevation allotments are grazed during the winter, the mid-elevation allotments are grazed primarily during the spring/fall season, and the high elevation allotments are used in the summer. The Escalante Canyons are typically grazed during the dormant (fall/winter) season. This allows for growing season rest of the riparian vegetation. The majority of livestock permittees do not graze on the Monument year-round. Most operators have their livestock on non-Monument lands at least part of the year. There is inadequate private land base in the local area to support current livestock levels without the use of Federal grazing lands at least part of the year. There are approximately 175,000 acres of Utah

School and Institutional Trust Administration Lands within the Monument. Most of these lands are grazed in conjunction with the BLM allotments through exchange of use agreements. The permittees pay the State for the grazing use on these lands, while the BLM administers the grazing on these state lands.

There are 73 separate grazing allotments within the Monument. Currently, 93 permittees are authorized to graze horses and cattle on the Monument. The authorized active use for the 1996-1997 grazing year was 75,684 Animal Unit Months (AUMs). Total licensed AUMs is 108,066. Livestock grazing is authorized, and occurs, within Wilderness Study Areas on the Monument. Rangeland management activities in WSAs are administered under guidelines in the Interim Management Policy for Lands under Wilderness Review. This policy outlines minimum data requirements and maximum acceptable impacts for range developments and livestock grazing increases. There are 18 allotments in the Monument whose boundaries partially or largely cross into adjacent Federal lands. The BLM administers grazing on these other Federal lands through Interagency Memorandums of Understanding. These other Federal lands are located within Glen Canyon National Recreation Area, Capitol Reef National Park, and Dixie National Forest. There are currently 6 grazing allotments within the Monument that do not have grazing permits attached to them and are not being grazed.

Allotment Management Plans (AMP) or other activity plans are developed for individual allotments. These plans include terms and conditions to achieve specific resource condition objectives. They also provide for a monitoring program to evaluate the effectiveness of management actions in achieving those objectives. Appendix 22 displays the allotments which have AMPs. Management objectives for individual allotments change over time. This helps to determine the level of intensity with which those allotments are managed in terms of planning, monitoring, and investments in range improvement projects. In order to describe the level of management required, each allotment has been placed in one of three categories. This process is referred to as Allotment Categorization and is comprised of: Improve (I), Maintain (M), and Custodial (C). The categorization of allotments into these categories is not dependent solely on a rangeland condition rating, but also reflects such factors as potential conflicts between resource uses, potential productivity on the allotment, and amount of Monument lands comprising the total acres of the allotment. Appendix 22 provides the category each allotment is placed in and the factors which describe the categorization process.

Part of the livestock management program on the Monument includes monitoring of the rangeland resources in order to determine progress toward meeting identified objectives. This involves the orderly collection, analysis, and interpretation of resource data from permanently established plots within allotments. The results of this monitoring help to determine the trend of vegetative communities. Trend is the direction of change in ecological status, or some other resource value rating, observed over time. This is usually described as being upward (higher rating), downward (lower rating), or static (no apparent trend). Appendix 23 summarizes the trend by allotment from the available monitoring data. The level of permitted grazing use on the Monument has decreased significantly over time. The season of use, or amount of time per year that livestock are grazing the Monument, has also decreased. These factors, in combination with rest rotation and deferred rotation grazing systems, have resulted in rangeland conditions improving over the last several decades.

Installation, use, maintenance, and/or modification of range improvements are often authorized through Cooperative Agreements. Range improvements are constructed to achieve livestock management objectives. The two types of range improvements are non-structural and structural. Non-structural range improvements include acreage of seedings and prescribed burn areas. Structural range improvements include: fences, corrals, stock trails, cabins, cattle guards, and water developments such as pipelines, wells, troughs, and reservoirs. Title to structural or removable improvements must be shared by the United States and cooperator(s) in proportion to the actual amount of the respective contribution to the initial construction. A cooperative agreement conveys no right, title, or interest in any lands, or resources held in the United States.

TRANSPORTATION AND ACCESS

There are two major highways which pass through the Monument: U.S. Highway 89 and State Route 12. Both are major traffic arteries bringing visitors to the Monument. These routes are popular for travelers going to regional destinations such as Grand Canyon National Park, Lake Powell, Glen Canyon National Recreation Area, Bryce Canyon National Park, Capitol Reef National Park, and Zion National Park. From west to east, US 89 traverses the Monument beginning about 10 miles east of Kanab and exits the Monument about 6 miles west of Big Water. New Paria is the only community within the Monument along US 89, although Kanab, Johnson Canyon, Church Wells, Big Water, and Page (Arizona) are located near the Monument along US 89. SR 12 runs through Tropic, and goes through the communities of Cannonville, Henrieville, Escalante, and Boulder.

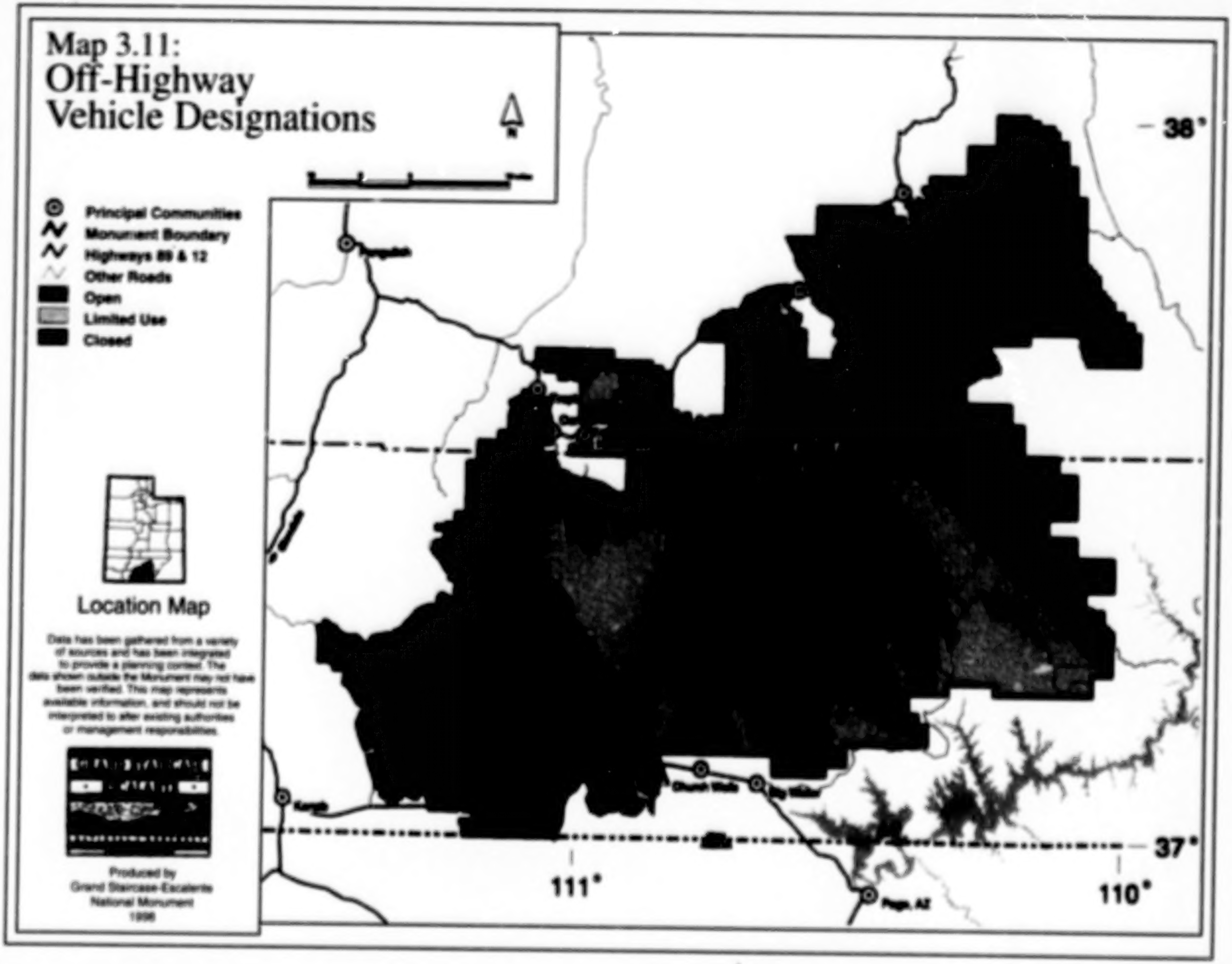
There are six State Backways in and around the Monument, including Burr Trail, Hole-in-the-Rock, Smoky Mountain, Cottonwood Wash, Paria River Valley, and Posey Lake.

Most motorized recreation use occurs on existing routes. There are two undesignated informal, locally used off-highway vehicle play areas: Little Desert, located 1.5 miles east of Escalante (S12 & 13 T35S R2E), and Twentymile Sand Pile, located just southwest of Hole-in-the-Rock Road near Harris Wash (S30 T37S R5E). Earlier planning documents in effect designated 64,619 acres (4 percent) as closed, 256,802 acres (15 percent) as limited, and 1,363,477 acres (81 percent) access open. No new designations have been made since the Monument was established (Map 3.11).

A total of 220 miles of trails, routes and undesignated historic trails are identified for visitor use. Only 6 miles of developed interpretive trails or trail easements are currently maintained. The Lower Calf Creek Falls trail is a self-guided interpretive trail. Proposed segments of the Great Western Trail are within the Grand Staircase portion of the Monument. A Memorandum of Understanding calls for cooperation and coordination of programs and activities associated with the Great Western Trail between the Great Western Trail Association, Forest Service, BLM, National Park Service, and the States of Utah, Idaho, Wyoming, and Arizona.

Over 15,000 acres of private land inholdings are scattered throughout the Monument in parcels ranging from 2.7 acres to 640 acres. Utah School and Institutional Trust lands were granted to the State of Utah by the Federal government at the time of statehood, for the purpose of supporting public schools. The State of Utah was granted four sections per township (generally sections 2, 16, 32 and 36). Over 175,000 acres of School Trust lands are now inholdings inside the Monument. Federal law requires that reasonable access be provided to non-Federal inholdings. Many of these inholdings currently have an access route to them, but some do not.

Vehicle/wildlife collisions are a problem on U.S. Highway 89 east of Kanab. From 1989-1996, Utah Department of Transportation recorded 126 mule deer vehicle collisions along this highway (Messer, 1997). Utah State University, in cooperation with the Utah Department of Transportation, has installed warning signs to help inform the public of the spring and fall deer migrations.



Map 3.11: Off-Highway Vehicle Designations

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Chapter 4

Environmental Consequences

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CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the environmental consequences of implementing any of the five planning alternatives described in Chapter 2. It focuses on the potential impacts on important resources, uses, and activities described in Chapter 3. It also identifies mitigation measures that could be taken to reduce or prevent impacts to resources and users. A tabular summary of these impacts can be found at the end of this Chapter.

The analysis is organized into five broad categories.

First, the impacts on Monument Resources are analyzed. This includes impacts on paleontological, archeological, historic, and biological resources. Impacts on biological resources include impacts on vegetation, threatened and endangered plant species, relict vegetation, riparian resources, impacts of weeds, cryptobiotic soils, wildlife, threatened and endangered animal species, and impacts to the Paunsaugunt deer herd.

Second, the impacts of the alternatives on Other Environmental Factors, including many which support and protect Monument resources, are analyzed. These include impacts on surface water quality, air quality, and Wild and Scenic River values.

Third, the impacts of the alternatives on Monument Uses and Users are analyzed. This includes impacts on research activities, livestock operations, forestry product use, recreational use, outfitters and guides, scenic quality, and primitive unconfined values.

Fourth, the impacts on Local Economics are analyzed. This includes impacts on local and regional economies projected from each of the alternatives.

Fifth, Cumulative Impacts are analyzed. Cumulative impacts are the effects on the environment of each alternative when coupled with the effects of other past, present, and reasonably foreseeable future actions occurring inside and outside the Monument boundary. This includes a discussion of past and present impacts such as livestock grazing, and future actions, such as development adjacent to the Monument.

Data on the location and extent of Monument resources, while considerable, varies according to resource type and locale. Further, our understanding of the impacts on and the interplay among these resources is evolving. As our data base and knowledge improves, adaptive management measures would be considered and proposed as actions in accordance with law and regulation, including provisions for public involvement.

ENVIRONMENTAL CONSEQUENCES

Analysis Assumptions and Guidelines

The following assumptions and guidelines were used to guide and direct the analysis of environmental consequences:

1. The alternatives would be implemented substantially, as described in Chapter 2, including Management Common To All Alternatives.
2. The Bureau of Land Management would have sufficient funding and personnel to implement the plan.
3. Current trends in recreation use would continue.
4. The planning period for the analysis is the next 15 years. Short-term impacts are those that would occur during the first five years of plan implementation. Long-term impacts are those that would occur beyond the first five years.
5. Specific actions to protect human life would be taken regardless of the management criteria in the plan alternatives.
6. Livestock grazing would continue to be governed by applicable laws and regulations.

7. Research would continue to be funded, at least at current levels.

Analysis Assumptions and Guidelines Specific to the Alternatives

The analysis of the alternatives is based on certain assumptions about each alternative. Those assumptions, by alternative, are summarized below. A tabular summary of the impact analysis by alternative is found in Table S.2.

ALTERNATIVE A (NO ACTION)

The majority of the Monument, 1,363,477 acres, would remain open to cross-country vehicle use. On about 15 percent of the Monument, 256,802 acres, cross-country vehicle use would be limited to existing routes. Four percent, 64,619 acres, would be closed to cross-country vehicle use.

It is assumed that a variety of visitor use sites would be constructed or existing sites would be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 16 sites would be constructed or expanded, disturbing 8 acres.

It is assumed that the development plan for Calf Creek campground would be completed, adding a group site to that campground. The existing 21 designated primitive campsites within the Monument would continue to be used.

There would be no group size restrictions under this alternative. It is assumed that impacts from visitor use would be very high in this alternative.

New water development facilities (spring developments, troughs, pumps, pipelines, impoundments) would be constructed when needed to protect Monument resources. Maintenance of existing water developments for livestock, wildlife and visitor use would continue, subject to compliance with current policies and practices, provided Monument resources were protected.

ALTERNATIVE B (PREFERRED)

Motorized and mechanized cross-country travel would be prohibited. Approximately 818 miles of routes would be designated open to the public for street legal motorized and mechanized use. On 591 of the 818 miles open to motorized and mechanized use, non-street-legal all-terrain (ATV) and dirt bike use would be allowed.

It is assumed that a variety of visitor use sites would be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 32 sites would be constructed or expanded, disturbing 16 acres.

No developed campgrounds would be constructed. Nine primitive campsites could be designated, disturbing 18 acres.

The group size limit on 143,874 acres would be 25 people and/or animals (without a permit). On 1,541,025 acres, the group size limit would be 12 people and/or animals. Allocations could be used to maintain use at low levels on 1,571,162 acres.

New water developments (spring developments, troughs, pumps, pipelines, and impoundments) could be constructed when such facilities were determined necessary to protect Monument resources. Maintenance of existing water developments could continue, subject to an evaluation of impacts to Monument resources.

ALTERNATIVE C

Motorized and mechanized cross-country travel would be prohibited. Approximately 1,187 miles of routes would be designated open to the public for street-legal motorized and mechanized use. Non-street legal ATVs and dirt bikes would not be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 20 sites would be constructed or expanded, disturbing 10 acres.

No developed campgrounds would be constructed. Thirteen primitive campsites could be designated, disturbing 26 acres.

The group size limit on 712,535 acres would be 50 people and/or animals. On 972,364 acres, the group size limit would be 12 people and/or animals. Allocations could be used to maintain use levels throughout the Monument on 1,684,899 acres.

New water developments (spring developments, troughs, pumps, pipelines, and impoundments) could be constructed when such facilities were determined necessary to protect Monument resources. Maintenance of existing water developments could continue, subject to an evaluation of impacts to Monument resources.

ALTERNATIVE D

Motorized and mechanized cross-country travel would be prohibited. Approximately 760 miles of routes would be designated open to the public for street legal motorized and mechanized use. Non-street legal ATVs and dirt bikes would not be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 20 sites would be constructed or expanded, disturbing 10 acres.

No developed campgrounds would be constructed. Thirteen primitive campsites could be designated, disturbing 26 acres.

The group size limit on 113,814 acres would be 25 people and/or animals. On 1,571,085 acres, the group size limit would be 12 people and/or animals, with limited exceptions in specific areas. Allocations could be used to maintain use levels throughout the Monument on 1,684,899 acres.

New water developments (spring developments, troughs, pumps and pipelines) would not be permitted. Maintenance of existing water developments could continue, subject to an evaluation of impacts to Monument resources.

ALTERNATIVE E

Motorized and mechanized cross-country travel would be prohibited. Approximately 1,264 miles of routes would be designated open to the public for street-legal motorized and mechanized use. On 980 miles of the 1,264 miles designated open to street legal motorized and mechanized use, non-street legal ATV and dirt bike use would be allowed.

It is assumed that a variety of visitor use sites could be constructed, or existing sites could be expanded. These sites could include parking areas, trailheads, trails, signs, interpretive sites, picnic areas, and pullouts. It is assumed that 43 sites would be constructed or expanded, disturbing 22 acres.

One developed campground could be constructed and three primitive campsites could be designated. Construction of these areas could disturb up to 21 acres.

There would be no group size limitations on 28,133 acres. Group size limits on 190,225 acres would be 75 people and/or animals (without a special permit). On 1,466,541 acres, the group size limit would be 12 people and/or animals. Allocations could be used to maintain use levels on 1,466,541 acres.

New water development facilities (spring developments, troughs, pumps, pipelines, impoundments) could be constructed when needed to protect Monument resources or to manage livestock, wildlife, recreation or watershed resources. Maintenance of existing water developments for livestock, wildlife and visitor use could continue, subject to compliance with current policies and practices, provided Monument resources were protected.

Monument Resources

IMPACTS ON PALEONTOLOGICAL RESOURCES

The locations of all paleontological resources within the Monument are not known. However, studies show that paleontological resources are prevalent throughout the entire area. Impacts to paleontological resources come from unauthorized collection of fossils, degradation by erosion, vehicles, and trampling by animals and humans. The greater the number of people, animals, and vehicles in an area, the more likely these impacts would occur. It is assumed that an increase in visitation could directly and indirectly affect these resources, as described below.

Alternative A (No Action)

Cross-country travel could occur on a large portion of the Monument. The miles of routes designated open for motor vehicle travel is the greatest in this alternative. This alternative would allow visitors to travel to more areas than the other alternatives, which could result in more widespread damage to or illegal collection of fossils.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, picnic areas, pullouts, and restrooms would create surface disturbance. Impacts to paleontological resources from this surface disturbence would be avoided by conducting surveys prior to any ground disturbing activities. If paleontological resources were present, the facility would be relocated, or the paleontological resource would be collected, stabilized, or excavated, or other mitigation measures would be taken prior to construction.

This alternative would allow for the fewest visitor site facilities and trails. It is estimated that 16 sites would be constructed, disturbing about 8 acres.

Completion of the Calf Creek campground would not affect any known paleontological resources. Prior to any ground disturbing activities associated with the completion of the campground, surveys would be conducted. If paleontological resources were found, impacts would be mitigated.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument. This would likely add to the impacts of this alternative on paleontological resources.

Research uses in the Monument could have both beneficial and adverse impacts on paleontological resources. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of paleontological resources in the Monument, or which result in stabilizing or preserving paleontological resources at risk of being damaged or destroyed. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to paleontological resources.

Livestock grazing could impact paleontological resources directly by trampling and indirectly through accelerating erosion. In all alternatives, uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on paleontological resources would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could disturb, damage, or destroy paleontological resources. These impacts could occur primarily through surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to paleontological resources would be avoided through a clearance process which would assure that paleontological resources were not present, or if such resources were present, the development would be moved to a site which would not affect paleontological resources. Maintenance of existing water developments could disturb, damage, or destroy paleontological resources through surface disturbing maintenance activities. Prior to authorizing maintenance activities, a clearance process would be performed, and impacts would be mitigated as appropriate.

In conclusion, paleontological resources could be adversely affected by this alternative more than in Alternatives B, C, D, and E, as it affords the fewest visitor management options. While this alternative would have the fewest visitor site facilities, impacts that would result from the lack of restrictions on motorized and mechanized cross-country travel, and other uncontrolled visitor use, have a large potential to impact resources. These impacts would increase over time.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel. This would afford substantial protection to paleontological resources from the direct effects of cross-country vehicle use, and from the indirect effects (unauthorized collection, erosion) of the increased access to paleontological resources cross-country vehicle use would provide.

Alternatives B, C, D, and E would close portions of the Monument to motorized and mechanized vehicle use on certain routes. This would afford protection of paleontological resources by reducing access to them. Based on the proposed access management and configuration of each alternative, the protection for paleontological resources would be the greatest in Alternative D, followed by Alternatives B, C, and E.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, picnic areas, pullouts, and restrooms would create surface disturbance in all alternatives. The least disturbance would occur in Alternatives C and D, disturbing 10 acres each over 15 years. Alternative B would disturb 16 acres and Alternative E would disturb 22 acres over 15 years. Impacts to paleontological resources from this surface disturbance would be mitigated by conducting surveys prior to any ground disturbing activities. If paleontological resources were present, the facility would be relocated or the paleontological resource would be collected, excavated, or stabilized, or other mitigating measures would be used.

Developed campgrounds and designated primitive campsites would be surveyed for paleontological resources before construction or designation. If any paleontological resources were found, impacts to these resources would be mitigated by either moving the campground or campsite, or by excavation, stabilization, or other measures.

In Alternative E, it is assumed that one developed campground would be built, disturbing 15 acres. No other alternative would allow construction of developed campgrounds. Alternatives C and D could designate 13 primitive campsites, disturbing 26 acres. Alternative B would designate 9 primitive campsites, disturbing 18 acres. Alternative E would designate 3 primitive campsites, disturbing 6 acres, in addition to the 15 acres disturbed for a developed campground.

Alternative B would result in the least disturbance from campsite development, with 18 acres disturbed. Alternative E is next with 21 acres, and Alternatives C and D would be most disturbing, at 26 acres each. The net acreage disturbance is not the only indicator of the relative risk to paleontological resources. The type, location, and specifications of the campsites could all influence the actual impacts on resources. All potential campsites would be surveyed prior to construction or designation in order to avoid or mitigate impacts.

In Alternative E, it is estimated that 43 facilities/sites would be provided. Alternative B would provide 32 facilities/sites, and Alternatives C and D would provide 20 facilities/sites each. Subsequent use of these facilities would concentrate visitors in these areas. This could result in impacts to paleontological resources located nearby. These impacts would be mitigated through site selection, design, interpretation, stabilization, excavation, or other measures.

In Alternatives B, C, D, and E, increases in visitation could be controlled through allocations, even as population and tourism pressures increase. Partial mitigation of the effects of increased tourism would be achieved by allocating the number of visitors in areas with sensitive paleontological resources. Allocations would be most prevalent in Alternatives C and D, where they could be implemented on 1,684,899 acres, followed by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocation could occur on 1,466,541 acres.

Research uses in the Monument could have both beneficial and adverse impacts on paleontological resources. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of paleontological resources in the Monument, or which result in stabilizing or preserving paleontological resources at risk of being damaged or destroyed. Benefits to paleontological resources from research use would most likely occur from Alternatives B and C. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to paleontological resources.

Livestock grazing could impact paleontological resources directly by trampling, and indirectly through accelerating erosion. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on paleontological resources would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources. Alternative D would authorize no new water developments, and Alternative E would authorize new water developments for the protection of Monument resources or for management of livestock, wildlife, or visitor use. Disturbance, damage, or destruction of paleontological resources in Alternatives B, C, and E could result from surface disturbing construction and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to paleontological resources in Alternative B, C, and E would be mitigated through a clearance process which would assure that paleontological resources were not present, or when such resources were present, the development would be moved to a site which would not affect paleontological resources. There would be no effects to paleontological resources in Alternative D, since no new water developments would be authorized. Maintenance of existing water developments in Alternative B, C, D and E could disturb, damage, or destroy paleontological resources through surface disturbing maintenance activities. A clearance would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts where necessary.

In conclusion, although Alternatives B, C, D, and E may increase some risks of adverse impacts on paleontological resources to varying degrees, all would have a significant net beneficial impact due to the restrictions on access and use and due to mitigation measures. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed by Alternative B, and then by Alternatives C and E. The adverse impacts of the alternatives also vary according to the amount of surface disturbance and visitor use allowed. Total surface disturbance from construction of visitor facilities, campgrounds, and designated campsites would be greatest in Alternative E, followed by Alternatives C, D, and B. However, the majority of these impacts to paleontological resources would be mitigated.

IMPACTS ON ARCHAEOLOGICAL AND HISTORIC RESOURCES

The locations of most cultural resource sites within the Monument are not known. Impacts to cultural resources, including both archaeological and historic sites, come from unauthorized collection, vandalism, erosion, trampling, and damage from vehicles driving over resources. The greater the number of people and vehicles in an area, the more likely these impacts are to occur. It is assumed that an increase in visitation could directly and indirectly affect cultural resources. Impacts could result from the activities described below.

Alternative A (No Action)

Many areas of the Monument would remain open to motorized and mechanized cross-country travel. On about 15 percent of the Monument, cross-country vehicle use would be limited to existing routes, and about 4 percent would be closed to cross-country vehicle use. This is the least restrictive alternative for these uses. This alternative would allow visitors to travel to more areas, which could result in more cultural resources being destroyed or collected, and more sites being illegally excavated or vandalized.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, picnic areas, pullouts, and restrooms would create surface disturbance. Impacts to cultural resources from this surface disturbance would be mitigated by conducting clearances prior to any ground disturbing activities. If cultural resources were found, the facility would be relocated, or the cultural resources would be collected, excavated, or stabilized, or other mitigating measures would be taken. This alternative would allow for the fewest visitor site facilities and trails. It is estimated that 16 sites would be constructed under this alternative, disturbing about 8 acres.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument, since visitor use is unrestricted in this alternative. This increased visitation would likely increase the adverse impacts of this alternatives on cultural resources, since no allocations or further visitor restrictions would be employed.

Research uses in the Monument could have both beneficial and adverse impacts on archeological and historic resources. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of archeological and historic resources in the Monument, or which result in stabilizing or preserving archeological and historic resources at risk of being damaged or destroyed. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to archeological and historic resources.

Livestock grazing could impact archaeological and historic resources through surface disturbance, erosion, and trampling. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on archeological and historic resources would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could disturb, damage, or destroy archeological and historic resources. These impacts would occur primarily through surface disturbing construction, and the direct impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to archeological and historic resources would be mitigated through a clearance process which would assure that archeological and historic resources were not present, or if such resources were present, the development would be moved to a site which would not affect archeological and historic resources. Maintenance of existing water developments could disturb, damage, or destroy archeological and historic resources through surface disturbing maintenance activities. A clearance would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts to cultural or historic resources where necessary.

In conclusion, cultural and historic resources could be impacted more in this alternative than in Alternatives B, C, D, and E, as it affords the fewest visitor management options. Most of the degrading impacts would result from motorized and mechanized cross-country travel, and from visitor use, which would increase. Uncontrolled over time, the lack of limits on group sizes could also result in degradation of cultural and historic resources.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel. This would afford substantial protection to cultural resources from the direct effects of cross-country vehicle use, and from the effects of the increased access to cultural resources cross-country vehicle use would provide.

Alternatives B, C, D, and E would close portions of the Monument to motorized and mechanized vehicle use on routes. This would afford protection of cultural resources by reducing access to them. This protection would be the greatest in Alternative D, followed by Alternatives B, C, and E.

In Alternatives B, C, D and E, impacts to archaeological resources (particularly rock art and structures with wood parts) from wildfire could occur. Because cross-country travel is prohibited and designated routes vary in Alternatives B, C, D, and E, impacts to cultural or archeological sites could be greater if limited access hindered wildfire suppression activities. Although emergency exceptions for wildfire suppression could be granted, the lack of maintained routes in certain areas and restrictions on the use of some types of equipment could delay or affect response. However, because fire is not a significant risk in most of the Monument, and because the access restrictions do not vary significantly in their impacts on suppression activities, these impacts would be minimal. The limited impacts which could occur would be more than offset by the protection that archaeological resources would receive from trampling, disturbance, or unauthorized collection associated with motorized cross-country travel and access.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms would create surface disturbance. Impacts to cultural resources from surface disturbance would be mitigated by conducting clearances prior to any ground disturbing activity. If cultural resources were found, the facility would be relocated, or mitigation measures, such as collection or stabilization, would be used. The least disturbance would occur in Alternatives C and D, each disturbing 10 acres over 15 years. Alternative B would disturb 16 acres, and Alternative E would disturb 22 acres over 15 years.

Developed campgrounds and designated primitive campsites would be surveyed for cultural resources before construction or designation. If resources were found, impacts would be mitigated by relocating the facility, if possible, or mitigation measures, such as collection or stabilization, would be used. In Alternative E, it is assumed that one developed campground would be built, disturbing 15 acres. No other alternatives would allow construction of developed campgrounds. Alternatives C and D could designate 13 primitive campsites, disturbing 26 acres. Alternative B would designate 9 primitive campsites, disturbing 18 acres. Alternative E could designate 3 primitive campsites, disturbing 6 acres.

In Alternative E, it is estimated that 43 visitor site facilities would be provided. Alternative B would provide 32 facilities/sites, and Alternatives C and D would provide 20 facilities/sites each. Subsequent use of these facilities would concentrate visitors in these areas. This could result in impacts to cultural resources located near the facilities. These impacts could be mitigated or prevented through site selection and design, collection, excavation, stabilization, or other measures.

In Alternatives B, C, D, and E, increases in visitation could be controlled, and impacts to cultural resources partially mitigated, through visitor allocations, even as population and tourism pressures increase. Allocations would be most prevalent in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed closely by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have both beneficial and adverse impacts on archeological and historic resources. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of archeological and historic resources in the Monument. They could also result in stabilizing or preserving archeological and historic resources at risk of being damaged or destroyed. Benefits to archaeological resources from research use would most likely occur from Alternatives B and C. Alternatives D and E would also promote research uses, but with more limitations. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to archeological and historic resources.

Livestock grazing could impact archaeological and historic resources by surface disturbance, trampling, and erosion. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on cultural and historic resources would be assessed, and if adverse impacts were found, adaptive management measures, such as fencing and alternative livestock rotation schedules, could be implemented.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources. Alternative D would authorize no new water developments. Alternative E would authorize new water developments for the protection of Monument resources, or for the management of livestock, wildlife, or visitor use. Disturbance, damage, or destruction of archeological and historic resources could occur in Alternatives B, C, and E from surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water development, such as troughs or impoundments. Impacts to archeological and historic resources in Alternative B, C, and E would be mitigated through a clearance process which would assure that archeological and historic resources were not present, or if such resources were present, the development would be moved to a site which would not affect archeological and historic resources. There would be no impacts to archeological and historic resources in Alternative D, since no new water developments would be authorized. Maintenance of existing water developments in Alternatives B, C, D and E could disturb, damage, or destroy archeological and historic resources through surface disturbing maintenance activities. A clearance would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts to cultural or historic resources.

In conclusion, although Alternatives B, C, D, and E may increase some risks of adverse impacts on archeological and historic resources to varying degrees, all would have a significant net beneficial impact due to the restrictions on access and use and due to mitigation. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed closely by Alternative B, and then by Alternatives C and E. The adverse impacts of the alternatives also vary according to the amount of surface disturbance and visitor use allowed. Total surface disturbance from construction of visitor facilities, campgrounds, and designated campsites would be greatest in Alternative E, followed by Alternatives C, D, and B. However, the vast majority of these impacts to archaeologic and historic resources would be mitigated as discussed above.

IMPACTS ON VEGETATION

Vegetation is a fundamental and vitally important element among the Monument's biological resources. Impacts to vegetation would result in impacts to other resources. Where impacts to vegetation lead to soil erosion, that erosion could adversely impact archeological, paleontological, and historic resources, as well as water quality and air quality. Impacts which lead to changes in the composition of vegetative associations, brought about by invasion of weeds, surface disturbance, or other factors, could impact other plant and animal communities.

Direct impacts to vegetation are caused by surface disturbance from recreational and other uses. Impacts include trampling of vegetation, degradation and loss of habitat, and introduction and spread of noxious weeds and non-native plants. These impacts come from the activities described below.

Alternative A (No Action)

Cross-country vehicle travel could occur on a large portion of the Monument. Access on routes is also the greatest in this alternative. Surface disturbance from vehicle travel, and from the increased visitation attributable to access, would impact vegetation.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, picnic areas, pullouts, and restrooms would create surface disturbance. This alternative would allow fewer facilities than the other alternatives, with an estimated 16 sites, disturbing about 8 acres. Impacts to vegetation would be minimized through careful site selection and design, and visitor sites would not be located in sensitive areas.

Population growth locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument. No allocations or group size limits are planned in this alternative.

Research uses in the Monument could have both beneficial and adverse impacts on vegetation. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of vegetation in the Monument. They could also result from stabilization or preservation of vegetation at risk of being damaged or destroyed. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to vegetation.

Livestock grazing impacts vegetation through ground disturbance, trampling, and removal of plants, and by altering the composition of vegetative associations. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on vegetation would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could disturb, damage, or destroy vegetation. These impacts would occur primarily through surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to vegetation would be mitigated through a clearance process which would assure that sensitive vegetation resources were not present, or when such resources were present, the development would be moved to a site which would not affect vegetation. Maintenance of existing water developments could disturb, damage, or destroy vegetation through surface disturbing maintenance activities. A clearance would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts to vegetation.

In conclusion, impacts to vegetation by actions in this alternative would be greater than in Alternatives B, C, D, and E, primarily because of lacks of restrictions on cross-country vehicle use, and because of having the fewest provisions for controlling visitor use and impacts.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel. This would afford substantial protection to vegetation from the impacts of cross-country vehicle use.

Alternatives B, C, D, and F would close portions of the Monument to motorized and mechanized vehicle use on routes. This would afford protection of vegetation by reducing access and the resultant impacts, and by reducing the potential for spread of noxious weeds and non-native plants associated with vehicle travel. This protection would be greatest in Alternative D (760 miles of open routes), followed by Alternative B (818 miles of open routes), and then by C (1,187 miles of open routes) and E (1,264 miles of open routes).

Because cross-country travel would be prohibited, and the number of routes designated for motorized access would vary in Alternatives B, C, D, and E, wildfire suppression activities could be limited. While emergency exceptions for wildfire suppression could be granted, the lack of maintained routes in certain areas, and restrictions on the use of some types of equipment, could limit response. However, because fire is not a significant risk in most of the Monument, and because the access restrictions do not vary significantly in their impacts on suppression activities, these impacts are expected to be minimal.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, picnic areas, pullouts, campgrounds, restrooms, and the designation of campsites would create surface disturbance in all alternatives. The least disturbance would occur in Alternative B, disturbing 34 acres, followed by Alternatives C and D, disturbing 36 acres each, and Alternative E, disturbing 43 acres.

In Alternatives B, C, D, and E, the impacts of increases in visitation could be mitigated through allocations to protect vegetation from the impacts of visitor use, even as population and tourism pressures increase. Allocations would be most frequently employed in Alternatives C and D, where allocations could be implemented on 1,684,899 acres. This is followed by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have both beneficial and adverse impacts on vegetation. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of vegetation in the Monument, or which result in a better understanding of plant communities and their environment. Benefits to vegetation from research use would most likely occur from Alternatives B and C. Adverse impacts could result from surface disturbing research activities or activities which remove or damage vegetation. Research project design would be required to mitigate adverse impacts to vegetation.

Livestock grazing impacts vegetation through ground disturbance, trampling, and removal of plants, and by altering the composition of vegetative associations. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on vegetation would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources. Alternative D would authorize no new water developments. Alternative E would authorize new water developments for the protection of Monument resources, or for the management of livestock, wildlife, or visitor use. The disturbance, damage, or destruction of vegetation in Alternatives B, C, and E could result from surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to vegetation in Alternative B, C, and E would be mitigated through a clearance process which would assure that sensitive vegetation was not present, or if such resources were present, the development would be moved to a site which would not affect vegetation. There would be no impacts to vegetation in Alternative D, since no new water developments would be authorized. Maintenance of existing water developments in Alternative B, C, D and E could disturb, damage, or destroy vegetation through surface disturbing maintenance activities. A clearance would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts to vegetation.

In conclusion, although Alternatives B, C, D, and E may increase some risks of adverse impacts to vegetation to varying degrees, all would have a significant net beneficial impact from restrictions on access, use, and due to mitigation. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed by Alternative B, and then by Alternatives C and E. The adverse impacts of the alternatives also vary according to the amount of surface disturbance and visitor use allowed. Total surface disturbance from construction of visitor facilities, campgrounds, and designated campsites would be greatest in Alternative E, followed by Alternatives C, D, and B. However, the majority of these impacts to vegetation would be mitigated as discussed above.

IMPACTS ON THREATENED AND ENDANGERED PLANT SPECIES

Three threatened and endangered plant species occur within the Monument. Direct and indirect impacts to these plants and their habitat could be caused by surface disturbance, livestock grazing, and visitor use. Impacts include mortality of plants, trampling of vegetation, compaction of soil, casual collection of plants, degradation and loss of habitat, and introduction and spread of noxious weeds and non-native plants. These impacts could result in declines in threatened and endangered plant population numbers and decreased population viability over time. Adverse impacts on threatened and endangered plants could adversely affect other plant or animal species associated with them.

Alternative A (No Action)

In this alternative 1,691 acres of known Jones' cycladenia (*Cycladenia humilis var. jonesii*) populations and habitat and 2,851 acres of Kodachrome bladderpod (*Lesquerella tumulosa*) populations and habitat would be in areas open to cross-country vehicle travel. Current and projected increases in cross-country vehicle travel could impact these populations. Ute ladies'-tresses (*Spiranthes diluvialis*) populations and habitat (64 acres) occur in areas that would remain closed to cross-country vehicle travel, and would not be impacted by current or increased use.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms create surface disturbance and increased use in adjacent areas. These surface disturbing activities would not be allowed in threatened and endangered plant populations or habitat without proper mitigation and consultation. Prior to any construction of facilities in the Monument, a survey would be required to determine the presence of listed species. These restrictions would protect 4,606 acres of known threatened and endangered plant habitat, and any new populations found in surveyed areas.

Currently, there are no visitor facilities present in 4,542 acres of known Kodachrome bladderpod and Jones' cycladenia populations and habitat. Increases in use at existing visitor site facilities would most likely have no direct or indirect impact on Kodachrome bladderpod or Jones' Cycladenia populations or habitat. Trails, campgrounds and trailheads occur within the 64 acres of known Ute ladies'-tresses habitat. Current and projected increases of day-use could impact Ute ladies'-tresses populations and habitat in this alternative.

Completion of Calf Creek campground and use of designated primitive campsites would have no effect on known threatened and endangered plants, since the facilities are not located near the known plant populations or habitat.

The projected increases in population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument, since visitor use is unrestricted in this alternative. This increased visitation could also increase the impacts of visitation on threatened and endangered plant species.

Research uses in the Monument could have beneficial impacts on threatened and endangered plant species. Beneficial impacts could result from research activities which focus on increasing knowledge of threatened and endangered plant species in the Monument, or which result in stabilizing or preserving threatened and endangered plant species. Direct or indirect adverse impacts to threatened and endangered plants in the Monument which could result from surface disturbing research activities would be mitigated. The activity could also be modified to avoid areas with threatened or endangered plants, or the research activity would not be permitted.

Currently, all known populations of threatened and endangered plants are subject to livestock grazing. Kodachrome bladderpod populations occur on barren sites, and Jones' cycladenia populations occur in barren sites, which do not tend to be heavily grazed. There are no known impacts from livestock grazing on those populations. Populations of Ute Ladies'-tresses occur in a riparian area immediately adjacent to an established visitor site. There are no known impacts from livestock grazing on that population. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on threatened and endangered plants would be assessed, and if adverse impacts were found, adaptive management measures would be implemented.

In conclusion, this alternative could cause impacts to Kodachrome bladderpod, Jones' cycladenia, and Ute ladies'-tresses populations and habitat. Impacts to 1,691 acres of known Jones' cycladenia populations and habitat and 2,851 acres of Kodachrome bladderpod populations and habitat could occur from cross-country vehicle travel. Impacts could also occur in unknown populations. There could be impacts to Kodachrome bladderpod and Jones' cycladenia from increased visitor use, if that use resulted in increased ATV use or trampling. Ute ladies'-tresses populations and habitat (64 acres) would remain in areas closed to cross-country vehicle travel.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel. This would afford substantial protection to known and unknown threatened and endangered plant populations and their habitat. This protection would be from both the direct and indirect effects of cross-country vehicle use, and from the effects of the increased access to the populations and their habitat that cross-country vehicle use would provide. These restrictions would help protect 4,606 acres of known threatened and endangered plant populations, and acres of unknown populations and their habitat, from unregulated use.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms would not be allowed in threatened and endangered plant populations in Alternatives B, C, D, and E. Any construction of facilities in the Monument would require surveys prior to construction to determine the presence of the species. These restrictions would protect 4,606 acres of known threatened and endangered plant populations, as well as any populations found during surveys.

None of the proposed developed campgrounds or primitive campsites would be constructed or designated in known threatened and endangered plant populations in Alternatives B, C, D, or E. Any construction of facilities in the Monument would require surveys prior to construction to determine the presence of the species. Campgrounds would not be allowed where they would impact threatened and endangered species.

Trails, campgrounds, and trailheads occur within the 64 acres of known Ute ladies'-tresses habitat. Groups size limits and allocations are proposed in Alternatives B, C, D, and E. Restrictions on use could prevent impacts to 64 acres of known Ute ladies'-

tresses populations and habitat. Construction of new trails, interpretive signs, and barriers could be used to redirect use and prevent impacts to Ute ladies'-tresses populations and habitat.

Alternatives B, C, D, and E allow allocations, which could be used to control visitation and mitigate impacts from increased visitation as population and tourism pressures increase. This would help protect threatened and endangered plant species. Allocations would be most widespread in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have beneficial effects on threatened and endangered plant species. Beneficial impacts could result from research activities which focus on increasing knowledge of the distribution and type of threatened and endangered plant species in the Monument or which result in stabilizing or preserving threatened and endangered plant species. Surface disturbing research activities would avoid areas with threatened or endangered plants, or the research activity would not be permitted.

Currently, all known populations of threatened and endangered plants are subject to livestock grazing. Kodachrome bladderpod populations occur on barren sites, and Jones' cycladenia populations occur in barren, high elevation sites, which do not tend to be heavily grazed. There are no known impacts from livestock grazing on those populations. Populations of Ute Ladies'-tresses occur in a riparian area immediately adjacent to an established visitor site. There are no known impacts from livestock grazing on that population. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on threatened and endangered plants would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

In conclusion, Alternatives B, C, D, and E would have beneficial effects on Kodachrome bladderpod and Jones' cycladenia populations because of restrictions on vehicle use. Potential impacts to Ute ladies'-tresses populations and habitat by visitation increases would be mitigated by interpretation, trail construction, and if necessary, physical barriers.

IMPACTS ON RELICT VEGETATION

Relict plant communities exist in areas that have been and continue to be inaccessible to livestock grazing and to motorized and mechanized vehicle travel. Direct and indirect impacts to these areas are caused by surface disturbance and visitor use. Impacts include trampling of vegetation, degradation and loss of habitat, and introduction and spread of noxious weeds and non-native plants. Relict plant-communities may support relict species of insects, invertebrates, and vertebrate animals. Impacts to relict plant communities could affect those associated organisms as well. These impacts come from the activities described below.

Alternative A (No Action)

Of the 12,986 acres of known relict plant communities, 5,513 acres are in areas designated open to motorized and mechanized travel. Use by cross-country vehicles in these areas does not currently occur due to inaccessibility. There are 258 acres of known relict plant communities in areas closed to motorized and mechanized use.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms create surface disturbance. These surface disturbing activities would not be allowed in relict plant communities.

Completion of Calf Creek campground and use of designated primitive campsites would have no effect on relict plant communities, since the facilities are not located near these communities.

Impacts from increased use in areas adjacent to relict plant communities may occur as a result of facility development, and as a result of projected increases in population and tourism.

Visitation from large groups could adversely impact relict plant communities. No group size restrictions or visitor allocations are proposed for this alternative. This could result in direct impacts which would increase as visitation increases.

Research uses in the Monument could have both beneficial and adverse impacts on relict vegetation. Beneficial impacts could result from research activities which focus on increasing the knowledge of the relict vegetation areas in the Monument or which result in stabilizing or preserving relict vegetation areas. Direct or indirect adverse impacts to relict vegetation in the Monument, which could result from surface disturbing research activities, would be mitigated by modifying the research activity to avoid the impact or by prohibiting the research activity.

In conclusion, this alternative could cause impacts to relict plant communities. Impacts include trampling of vegetation, degradation and loss of habitat, and introduction and spread of noxious weeds and non-native plants through human or animal foot traffic. Unrestricted use by visitors also has the potential to impact relict plant communities.

Alternatives B, C, D, E

In Alternatives B, C, D and E, the Monument would be closed to motorized and mechanized cross-country travel. These restrictions would help protect known and unknown relict plant communities by reducing access to these areas.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms create surface disturbance. These activities would not be allowed in relict plant communities in Alternative B, C, D, or E.

None of the proposed developed campgrounds or primitive campsites would be constructed or designated in known relict plant communities in Alternatives B, C, D, or E. Any construction of facilities in the Monument would require surveys prior to construction to determine proximity to relict plant communities, and if direct or indirect impacts to relict plant communities were determined to be possible, these impacts would be mitigated or the campground or primitive campsite would be moved.

Alternatives B, C, D, and E allow allocations, which could be used to control visitation and mitigate the impacts of increased visitation as population and tourism pressures increase. This would help protect relict plant communities. Allocations would be most widespread in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed closely by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have both beneficial and adverse impacts on relict vegetation. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of relict vegetation areas in the Monument, or which result in stabilizing or preserving relict vegetation areas. Direct or indirect adverse impacts to relict vegetation in the Monument, which could result from surface disturbing research activities, would be completely mitigated or modified to avoid relict vegetation areas, or the research activity would not be permitted.

In conclusion, Alternatives B, C, D, and E would have significant net beneficial impacts due to the restrictions on access and use, and from mitigation. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed closely by Alternative B, and then by Alternatives C and E.

IMPACTS ON RIPARIAN RESOURCES

Riparian areas, though they total less than one percent of all lands in the Monument, are among the most productive and ecologically valuable resources. Riparian resources are affected by trampling and removal of natural vegetation or other surface disturbance, which could cause bank disturbance and destabilization, increased erosion and siltation, disruption to riparian dependent plants and wildlife, and degradation of water quality.

Alternative A (No Action)

Many areas of the Monument would remain open to cross-country vehicle travel under this alternative, including some riparian habitat. Increases in cross-country vehicle use would increase impacts to these resources.

Construction of visitor site facilities, such as trailheads, interpretive sites, parking areas, pullouts, campgrounds, and restrooms, create surface disturbance. These surface disturbing activities would not be allowed to affect riparian areas.

No group size restrictions or allocations on backpacking, hiking, and use of pack animals are proposed to be established in this alternative. Unrestricted use in riparian areas, some of the most heavily used currently, could result in direct impacts to these areas. Impacts would potentially be greatest for the Escalante Canyons, due to its popularity.

Research uses in the Monument could have both beneficial and adverse impacts on riparian resources. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of riparian resources in the Monument, or which result in stabilizing or preserving riparian resources at risk of being damaged or destroyed. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to riparian resources.

Livestock grazing could impact riparian resources through surface disturbance, streambank disturbance, removal of vegetation, water quality degradation, increased erosion and siltation, trampling, and the alteration of the composition of vegetative associations. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on riparian resources would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

The construction of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could have both beneficial and adverse effects on riparian resources. Benefits could occur if water developments were used to move livestock away from riparian resources. Adverse impacts could occur if a significant amount of water were piped away from the source, resulting in reduced flow rates or dewatering. Impoundments could have an adverse impact by retaining water which would otherwise flow downstream. Adverse impacts to riparian resources from water development would be prevented through design, or the water development would not be authorized.

In conclusion, in this alternative, impacts would continue to occur to riparian resources. These impacts would be expected to increase as use increases.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel, affording substantial protection to riparian resources. This protection would be from both the direct and indirect effects of cross-country vehicle use, and from the effects of the increased access to the riparian areas that cross-country vehicle use would provide.

Alternatives B, C, D, and E would close portions of the Monument to motorized and mechanized vehicle use on routes. This would afford protection of riparian resources by reducing access and resultant impacts. This protection would be greatest in Alternative D, with 760 miles of routes designated open, followed by Alternative B, with 818 miles of routes designated open. Alternative C would provide 1,187 miles of routes designated open, and Alternative E would provide 1,264 miles.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms create surface disturbance. The greater the number of facilities proposed in riparian areas, the greater the potential impacts to riparian habitat. None of the 16 - 22 acres of proposed disturbance in Alternatives B, C, D, or E would directly impact riparian habitat.

Developed campgrounds and designated primitive campsites would not directly affect riparian habitat. Prior to any designation, these areas would be evaluated for impacts to riparian resources. Riparian habitat would be avoided in the location of campgrounds or campsites.

Subsequent use of visitor site facilities would concentrate visitors. This could result in impacts to riparian areas around facilities. For example, there would be increased risks of the spread of weeds due to vehicular and human or animal foot traffic. Projected increases in use in areas of existing and new facilities would increase impacts to riparian habitat in the vicinity of these facilities. Potential indirect impacts from visitor use in adjacent areas would be greatest in Alternative E because the greatest number of sites would be made available for visitor use, followed by Alternative B.

Alternatives B, C, D, and E would allow allocations to control visitation as population and tourism pressures increase. This would help protect riparian resources. Visitor allocations would be most widespread in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have both beneficial and adverse impacts on riparian resources. Beneficial impacts could result from research activities which focus on increasing knowledge of the distribution and type of riparian resources in the Monument, or which result in a better understanding of riparian areas. Benefits to riparian resources from research use would most likely occur from Alternatives B and C. Alternatives D and E, which also promote research uses, but with more limitations, would follow. Adverse impacts could result from surface disturbing research activities or activities which remove or damage riparian resources. Research project design would be required to mitigate adverse impacts to riparian resources.

Livestock grazing could impact riparian resources through surface disturbance, streambank disturbance, removal of vegetation, water quality degradation, increased erosion and siltation, trampling, and the alteration of the composition of vegetative associations. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on riparian resources would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would allow construction of new water developments only when such developments protect Monument resources. Alternative E would allow the construction of new water developments for the management of livestock, wildlife, or visitor use, as well as to protect Monument resources. In Alternatives B, C and E, the construction of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could have both beneficial and adverse effects on riparian resources. Beneficial effects could occur if new water developments move livestock away from springs and streams, decreasing erosion, water quality degradation, and other problems associated with livestock. Alternative D would not allow the construction of water developments.

Adverse impacts from water development could occur if a significant amount of water were piped away from the source, resulting in reduced flow rates or dewatering, and subsequent water quality impacts. Impoundments could have an adverse impact by retaining water which would otherwise flow downstream. Adverse impacts would be avoided by the design of the water developments before water developments would be authorized.

In conclusion, although Alternatives B, C, D, and E may increase some risks of adverse impacts on riparian resources to varying degrees, all would have a significant net beneficial impact due to the restrictions on access and use and due to mitigation. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed closely by Alternative B, and then by Alternatives C and E.

IMPACTS OF WEEDS

Non-native plants and noxious weeds displace native species and affect the structure of plant associations. These species are spread by a variety of means, some of which (e.g., vehicles and foot traffic) are directly attributable to human actions. Once established in disturbed sites, weeds may spread into adjacent undisturbed lands and disrupt natural plant and animal associations. Direct and indirect impacts from weeds are a result of surface disturbance and visitor use. Impacts include displacement of native vegetation, loss of biodiversity and habitat for animals, degradation of surface water quality, and loss of surface water quantity. These impacts come from the activities described below.

Alternative A (No Action)

This alternative would have the greatest potential for the spread of weeds within the Monument. Many areas of the Monument would remain open to unregulated cross-country vehicle travel. This could serve as a source of dispersement for seeds and could cause surface disturbance, and increase the risk that weed species could spread into previously unaffected areas.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, and restrooms create surface disturbance. Construction of visitor site facilities, disturbing 8 acres, could facilitate the introduction of weeds. Prior to allowing any construction, areas would be surveyed for weeds, and appropriate mitigation measures would be required to prevent their spread.

Completion of Calf Creek campground could introduce weeds into this habitat. Increased recreational use in 21 designated primitive areas would increase the potential for spread of weeds in these areas. Lack of designated campgrounds, and increases in unregulated and dispersed camping with no group size limitations, could also increase the spread of weeds.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument, since visitor use is unrestricted in this alternative. This increased visitation would also increase the adverse impacts of weeds.

Research uses in the Monument could diminish or expand the impacts of weeds. Research focused on weeds, their distribution in the Monument, their effect on plant communities, or the effect of weeds on other Monument resources, would help to diminish the impacts of weeds by increasing our knowledge of them. Research activities which involve surface disturbing activities could encourage the establishment of weeds in the disturbed areas. Research project design would be required to mitigate adverse impacts of weeds.

Livestock grazing could increase weed dispersal through surface disturbance, removal of vegetation, alteration of the composition of vegetative associations, disturbance of cryptobiotic soils, and transportation of weed seeds. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on the introduction and spread of weeds would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

This alternative allows new water developments to protect Monument resources, and allows maintenance of existing developments, provided Monument resources are protected.

The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could create disturbance that would lead to the spread of weeds, or the introduction of weeds into new areas. These impacts would occur primarily through surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water development, such as troughs or impoundments. Impacts from weeds would be mitigated through surveys, conducted prior to authorizing water development, to detect the presence of weeds, and through a monitoring program, subsequent to development, to detect the establishment of weeds. Appropriate mitigation to prevent the establishment and spread of weeds would be required. Maintenance of existing water developments could cause disturbance that would lead to the spread of weeds through surface disturbing maintenance activities. Mitigation of maintenance impacts from weeds would be achieved by monitoring to detect weeds in disturbed areas caused by water development maintenance, and eradication of weeds to prevent them from spreading.

In conclusion, this alternative affords the most unregulated use throughout the Monument. Unregulated uses, such as cross-country vehicle use, camping, and construction activities, would be likely to increase the establishment and spread of weeds.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel, affording substantial protection against the spread of weeds. This protection would be from both the direct and indirect effects of cross-country vehicle use, and from the effects of the increased access that cross-country vehicle use would provide.

Alternatives B, C, D, and E would close portions of the Monument to motorized and mechanized vehicle use on routes. This would afford protection from the spread of weeds by reducing access and resultant impacts. This protection would be greatest in Alternative D, with 760 miles of routes designated open, followed by Alternative B, with 818 miles of routes designated open. Alternative C would provide 1,187 miles of routes designated open, and Alternative E would provide 1,264 miles.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, and restrooms would create surface disturbance in Alternatives B, C, D, and E. The greater the number of facilities proposed, the greater the potential for the spread of weeds. The greatest amount of disturbance would occur in Alternative E (22 acres over 15 years), followed by Alternative B (16 acres), Alternative C (10 acres), and Alternative D (10 acres). Prior to allowing any construction, areas would be surveyed for weeds, and appropriate mitigation measures would be required to prevent their spread and establishment.

Developed campgrounds and designated primitive campsites would affect the spread of weeds. The greater the size of the campground or the greater the number of designated campsites, the greater the potential for spread of weeds. In Alternative E, it is assumed that one developed campground would be built, disturbing 15 acres. No other alternatives would allow construction of new developed campgrounds. Alternatives C and D could designate 13 primitive campsites, disturbing 26 acres in each alternative. Alternative B would designate 9 primitive campsites, disturbing 18 acres. Alternative E would designate 3 primitive campsites, disturbing 6 acres, for a total of 21 acres disturbed in Alternative E. Prior to any designation, these areas would be evaluated for the presence, potential establishment, and spread of weeds. Steps would be taken to mitigate these impacts by relocating the facility and/or taking steps to ensure that weeds would not be established or spread.

Group size and allocations established to limit the number of people in specific areas are proposed for Alternatives B, C, D, and E. These limitations would partially mitigate the impacts of visitation by large groups and reduce the potential for spread of weeds into previously unaffected areas. Impacts would be the same in nature and would vary slightly in magnitude across Alternatives B, C, D, and E.

Research uses in the Monument could diminish or expand the impacts of weeds. Research focused on weeds, their distribution in the Monument, their effect on plant communities, or the effect of weeds on other Monument resources, would help to diminish the impacts of weeds by increasing our knowledge base. Benefits from research would most likely occur from Alternatives B and C. Alternatives D and E also promote research uses, but with more limitations. Research activities that involve surface disturbing activities could encourage the establishment of weeds in the disturbed areas. Research project design would be required to mitigate adverse impacts of weeds.

Livestock grazing could increase weed dispersal through surface disturbance, removal of vegetation, alteration of the composition of vegetative associations, disturbance of cryptobiotic soils, and transportation of weed seeds. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on the introduction and spread of weeds would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would authorize new water developments when necessary for the protection of Monument resources. Alternative D would authorize no new water developments. Alternative E would authorize new water developments for the protection of Monument resources, or for the management of livestock, wildlife, or visitor use. In Alternatives B, C, and E, the establishment and spread of weeds could result from surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts from the establishment of weeds due to water developments in Alternative B, C, and E would be mitigated through monitoring to detect the establishment of weeds, and through the eradication of weeds detected. There would be no effects from weed establishment due to water development in Alternative D, since no new water developments would be authorized. Maintenance of existing water developments could cause disturbance, which would lead to the spread of weeds through surface disturbing maintenance activities. Mitigation of maintenance impacts would be achieved by monitoring to detect weeds and eradicating them.

In conclusion, none of Alternatives B, C, D, or E would be likely to contribute significantly to the spread of weeds, especially relative to the No Action Alternative. All alternatives would reduce the potential for weed dispersion throughout large areas of the Monument by closing them to cross-country vehicle travel. Total surface disturbance from construction of visitor facilities, campgrounds, and designated campsites which could introduce or spread weeds would be greatest in Alternative E, followed by Alternatives C, D, and B.

IMPACTS ON CRYPTOBIOTIC SOILS

Cryptobiotic soils perform many important ecological functions including preventing soil erosion, fixing atmospheric nitrogen, improving plant soil-water relationships, contributing to nutrient cycling, and providing sites for seed germination and plant growth. These soils are particularly sensitive to ground disturbance, especially compression that could result from foot traffic by animals or humans. It is probable that adverse impacts to cryptobiotic soils have adverse impacts on many other resources and environmental factors, including soils, water quality, nutrient cycling, and on vegetation and the other organisms it supports. The location and distribution of cryptobiotic soils in the Monument are not well known. Impacts to cryptobiotic soils come from all soil disturbing activities. These impacts come from the activities described below.

Alternative A (No Action)

This alternative would allow the greatest potential for disturbance of cryptobiotic soils from cross-country vehicle travel. Travel on existing travel routes would not impact cryptobiotic soils because they are assumed not to be present in these disturbed areas.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms creates surface disturbance. Construction of visitor site facilities totaling 8 acres could impact cryptobiotic soils in areas previously unaffected. Prior to allowing any construction, areas would be surveyed for cryptobiotic soils, and mitigation measures would be required. Areas containing cryptobiotic soils would be avoided as much as possible in the placement of these facilities.

Completion of Calf Creek campground and continued use of designated primitive campsites would have no additional effect on cryptobiotic soils since these sites are already established and disturbed.

No group size restrictions or allocations are proposed in this alternative. Unrestricted use in areas of cryptobiotic soils could result in direct impacts.

Research uses in the Monument could have both beneficial and adverse impacts on cryptobiotic soils. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and nature of cryptobiotic soils in the Monument, or which result in stabilizing or preserving cryptobiotic soils. Adverse impacts could result from surface disturbing research activities. Research project design would be required to mitigate adverse impacts to cryptobiotic soils.

Livestock grazing impacts cryptobiotic soils by trampling. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on cryptobiotic soils would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

This alternative would allow new water developments when necessary for the protection of Monument resources. The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could disturb, damage, or destroy cryptobiotic soils. These impacts would occur primarily through surface disturbing construction, and the direct impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to cryptobiotic soils would be mitigated through a clearance process that would identify and avoid cryptobiotic soils in the locations of new water developments. Maintenance of existing water developments could disturb, damage, or destroy cryptobiotic soils through surface disturbing maintenance activities. A clearance would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts to cryptobiotic soils.

In conclusion, impacts to cryptobiotic soils would occur in this alternative. These impacts would come from unregulated cross-country vehicle use, and lack of visitor allocations or restrictions on group size, combined with increased visitation.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to cross-country vehicles. This would benefit cryptobiotic soils. It is assumed that cryptobiotic soils are not present on designated travel routes.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms would create surface disturbance. The greater the number of facilities proposed, the greater the potential impacts to cryptobiotic soils. The greatest disturbance would occur in Alternative E (22 acres), followed by Alternative B (16 acres), Alternative C (10 acres), and Alternative D (10 acres). Prior to allowing any construction, areas would be surveyed for cryptobiotic soils, and mitigation measures would be required to avoid impacts to areas with cryptobiotic soils.

Developed campgrounds and designated primitive campsites could impact cryptobiotic soils. The greater the size of the campground or the greater the number of designated campsites, the greater the potential impact to cryptobiotic soils. In Alternative E, it is assumed that one developed campground would be built, disturbing 15 acres. No other Alternatives would allow construction of developed campgrounds. Alternatives C and D could designate 13 primitive campsites, disturbing 26 acres in each alternative. Alternative B would designate 9 primitive campsites, disturbing 18 acres. Alternative E would designate 3 primitive campsites, disturbing 6 acres. Prior to any designation, these areas would be evaluated for presence of cryptobiotic soils, and impacts to cryptobiotic soils would be mitigated.

The various alternatives propose construction of facilities and campgrounds. Subsequent use of visitor site facilities and campgrounds would concentrate visitors, which could result in impacts to cryptobiotic soils around facilities. Projected increases in use in areas of existing and new facilities would increase impacts in these areas.

Group size limits and visitor allocations established to limit the number of people in specific areas are proposed for Alternatives B, C, D, and E. These limitations would reduce the potential for impacts to cryptobiotic soils.

Allocations would be most widespread in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have both beneficial and adverse impacts on cryptobiotic soils. Beneficial impacts could result from research activities which increase knowledge of the distribution and nature of cryptobiotic soils in the Monument. Benefits to cryptobiotic soils from research use would be most likely to occur from Alternatives B and C. Adverse impacts could result from surface disturbing research activities or activities which remove or damage cryptobiotic soils. Research project design would be required to mitigate adverse impacts to cryptobiotic soils.

Livestock grazing impacts cryptobiotic soils by trampling. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on cryptobiotic soils would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources. Alternative D would authorize no new water developments. Alternative E would allow new water developments for the protection of Monument resources, or for the management of livestock, wildlife, or visitor use. Water developments could disturb, damage, or destroy cryptobiotic soils as a result of surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to cryptobiotic soils would be mitigated through a clearance process that would assure that cryptobiotic soils were not present, or if such resources were present, move the development to a site which would not affect cryptobiotic soils. There would be no effects to cryptobiotic soils from such development in Alternative D since no new water developments would be authorized. Maintenance of existing water developments could disturb, damage or destroy cryptobiotic soils through surface disturbing maintenance activities. Clearances would be performed prior to the authorization of any maintenance activities, and measures would be taken to mitigate impacts to cryptobiotic soils.

In conclusion, although Alternatives B, C, D, and E could increase some risks of adverse impacts to cryptobiotic soils to varying degrees, all would have a significant net beneficial impact due to the restrictions on access and use and due to mitigation. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed closely by Alternative B, and then by Alternatives C and E. The adverse impacts of the alternatives also vary according to the amount of surface disturbance and visitor use they allow. Total surface disturbance from construction of visitor facilities, campgrounds, and designated campsites would be greatest in Alternative E, followed by Alternatives C, D, and B. However, the majority of these impacts to cryptobiotic soils would be mitigated as discussed above.

IMPACTS ON WILDLIFE

Monument wildlife includes all vertebrate and invertebrate animal species (aquatic and terrestrial), including insects, reptiles and amphibians, fish, birds, and mammals. Wildlife species are interrelated and interdependent; impacts to any one are likely to impact others.

Direct impacts to wildlife include disturbance or displacement due to interactions with humans. Indirect impacts include those from habitat degradation, habitat fragmentation, and disruption of food or water sources.

Alternative A (No Action)

In this alternative, many areas of the Monument would remain open to cross-country motorized and mechanized vehicle use. As a result, the potential for impacts on wildlife due to interactions with humans is highest in this alternative. The potential for impacts due to habitat degradation and habitat fragmentation related to route use and to cross-country vehicle travel is also highest in this alternative.

Visitor site facilities (trailheads, trails, interpretive sites, parking areas, etc.) could impact wildlife through increasing the potential for interaction with humans in those areas, and through habitat fragmentation and degradation. This alternative allows for the fewest facilities, therefore impacting wildlife the least of all alternatives in this respect. It would allow for 16 sites constructed or expanded, disturbing 8 acres.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument, since visitor use is unrestricted in this alternative. This increased visitation would also increase the adverse impacts of visitor use on Monument wildlife.

Animal damage control activities would directly impact targeted wildlife species by removing individual animals from the population. This could indirectly impact prey species' populations as well.

Research uses in the Monument could have both beneficial and adverse impacts on wildlife. Beneficial impacts could result from research activities which focus on increasing knowledge of the distribution and populations of wildlife in the Monument. Adverse impacts could result from surface disturbing or wildlife disturbing research activities. Research project design would be required to mitigate adverse impacts to wildlife.

Livestock grazing could impact wildlife by competing for habitat, especially in riparian areas. Livestock grazing could also impact wildlife by changing vegetation composition, impacting vegetation, and impacting habitat. Aquatic wildlife could be impacted by water quality degradation, and by reduction of vegetative cover in and near streams and water sources. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on wildlife would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

This alternative would allow new water developments when necessary for the protection of Monument resources.

Maintenance of existing water developments, and the construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could have adverse impacts on wildlife. Adverse impacts could result from surface disturbance and construction activities associated with new water developments, or the maintenance of existing water developments, or from habitat alteration associated with water developments.

In conclusion, this alternative has the greatest potential overall to impact Monument wildlife, primarily because it lacks restrictions on vehicle use and on visitor use. However, impacts attributable to the construction of visitor facilities, such as new trailheads or parking lots, would be less in this alternative.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel. This would afford substantial protection to wildlife from the impacts of cross-country vehicle use, and from the effects of the increased access to wildlife and wildlife habitat cross-country vehicle use would provide.

Alternatives B, C, D, and E would close portions of the Monument to motorized and mechanized vehicle use on routes. This would afford protection of wildlife by reducing access to them, and by reducing the potential for wildlife/human interactions. This protection would be the greatest in Alternative D, followed by Alternatives B, C, and E.

Visitor site facilities (trailheads, trails, interpretive sites, parking areas, etc.), could impact wildlife by increasing the potential for interaction with humans in those areas, and through habitat fragmentation and degradation. Alternatives C and D would have the least impact on wildlife from visitor site facilities, with 20 sites each, disturbing 10 acres. Alternative B would allow up to 32 sites, disturbing 16 acres, while Alternative E would allow 43 sites, disturbing 22 acres.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument. That would increase the impact of visitor use on Monument wildlife.

Animal damage control activities would directly impact targeted wildlife species by removing individual animals from the population. This could impact prey species' populations as well. Alternatives B and C would restrict animal damage control activities more than Alternative A, in that they would require that other means of control be exhausted prior to allowing animal damage control activities. Alternative E would restrict animal damage control activities where conflicts with visitor use occur, or where conflicts with objectives for management of fish and wildlife occur. Alternative D precludes animal damage control activities.

Research uses in the Monument could have both beneficial and adverse impacts on wildlife. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and populations of wildlife in the Monument. Benefits to wildlife from research use would most likely occur from Alternatives B and C. Adverse impacts could result from surface disturbing or wildlife disturbing research activities. Research project design would be required to mitigate adverse impacts to wildlife.

Livestock grazing could impact wildlife by competing for habitat, especially in riparian areas. Livestock grazing could also impact wildlife by changing vegetation composition, impacting vegetation, and impacting habitat. Aquatic wildlife could be impacted by water quality degradation, and by reduction of vegetative cover in and near streams and water sources. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on wildlife would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources. Alternative D would authorize no new water developments. Alternative E would authorize new water developments for the protection of Monument resources, or for the management of livestock, wildlife, or visitor use. Maintenance of existing water developments, and the construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could have adverse impacts to wildlife, resulting from surface disturbance and construction activities. The most adverse impact to wildlife from water developments would likely result from Alternative E, which allows water developments for reasons other than the protection of Monument resources (and therefore would likely allow more water developments overall), followed by B and C. Alternative D would not permit new water development.

In conclusion, although Alternatives B, C, D, and E may increase some risks of adverse impacts to wildlife to varying degrees, all would have a significant net beneficial impact due to the restrictions on access and use and mitigation. Alternative D, with the fewest miles of routes designated open, would have the least impact from vehicle travel, followed closely by Alternative B, and then by Alternatives C and E. The adverse impacts of the alternatives also vary according to the amount of surface disturbance and visitor use they allow. Total surface disturbance from construction of visitor facilities would be greatest in Alternative E, followed by Alternative B and then Alternatives C and D. However, the majority of these impacts to wildlife would be mitigated as discussed above.

IMPACTS ON THREATENED AND ENDANGERED ANIMAL SPECIES

There are 2 Federally listed threatened species and 6 Federally listed endangered species known within the Monument. The threatened species are the bald eagle and the Mexican spotted owl. The endangered species are the California condor, (an experimental, non-essential population), the Colorado squawfish, American peregrine falcon, razorback sucker, the Kanab ambersnail, and the southwestern willow flycatcher. There are no known candidate species within the boundaries of the Monument.

The bald eagle, *(Haliaeetus leucocephalus)*, was listed as endangered in 1967, before the passage of the Endangered Species Act in 1973. The United States breeding population had declined due to habitat destruction and degradation, illegal shooting, contamination of its food source and reproductive impairment from pesticides and heavy metals. In 1978, the bald eagle was listed as endangered in 43 of the lower 48 states, including Utah. Since that time, the nesting population has almost tripled, from fewer than 500 nesting pairs in 1963, to about 5,000 nesting pairs currently. In 1995, the bald eagle was reclassified to threatened in the lower 48 states in recognition of its improved status. Although the bald eagle is not known to nest in the Monument, it does occur routinely in winter, and has been reported from numerous locations within the Monument. Threats to the species include loss of suitable habitat, mortality from shooting, poisoning, electrocution, and other causes, and reduced reproduction caused by environmental contaminants.

The Mexican spotted owl, *(Strix occidentalis lucida)*, was listed as a threatened species in 1993. The population had declined due to habitat loss and alteration. Harvest of old-growth timber stands, even-aged timber harvest systems, and wildfires are contributing factors. It is estimated that there are at least 60 spotted owls in Utah, primarily in the southern part of the State. Its populations in Utah are small and scattered, mainly in rocky canyon country. It is known to nest within the Monument. Threats to the species include timber harvest and fire; livestock grazing and recreational activities have also been suggested as threats.

The California condor *(Gymnogyps californicus)*, was listed as an endangered species in 1967. In late 1996 there were 121 California condors in the world, of those, 17 were in the wild in California. The other 104 were in captive breeding facilities. In 1996 and 1997, releases of the condor were made in Northern Arizona under Section 10(j) of the Endangered Species Act and its "non-essential, experimental population" designation. Nineteen birds have been released; 15 remain in the wild. Condors have been sighted flying over the Monument, and have been sighted at several locations to the northeast and northwest of the Monument. Threats to the species include mortality from collisions with powerlines, poisoning, and shooting.

The peregrine falcon *(Falco peregrinus)*, was listed as an endangered species in 1970. It is expected to be proposed for delisting in August, 1998. The population had declined due primarily to the use of organochloride pesticides. In 1975, the population reached a low of 324 nesting pairs in North America. The banning of DDT made the recovery of the peregrine falcon possible, but the recovery was accelerated by captive breeding programs, reintroduction efforts, and protection of nest sites. More than 6,000 falcons have been reintroduced into the wild since 1974. In Utah, it is estimated that there are about 180 breeding pairs, including some within the Monument. Threats to the species include loss of suitable habitat, mortality from shooting, and reduced reproduction caused by environmental contaminants.

The southwestern willow flycatcher *(Empidonax traillii extimus)*, was listed as an endangered species in 1995. The population has declined due to habitat loss and modification, and to brood parasitism by the brown-headed cowbird, among other things. The known breeding population is estimated at between 300 and 500 pairs, with only about 75 sites where it is known to breed. In Utah, the southwestern willow flycatcher occurs in the southern third of the state, including within the Monument. Its decline in Utah is attributed to habitat losses to suburban expansion and other changes along the Virgin River, inundation by Lake Powell on the Colorado and San Juan Rivers, and encroachment of tamarisk throughout the region, as well as to brood parasitism by the brown-headed cowbird. Surveys in 1996 revealed 25 individuals in Utah; presumably, the actual population is larger. The southwestern willow flycatcher is present and presumed to nest within the Monument. Threats to the species include habitat loss, livestock impacts, tamarisk invasion, water development, floods, gene pool limitation, and cowbird parasitism.

The Colorado squawfish *(Ptychocheilus lucius)*, was listed as an endangered species in 1967. The razorback sucker *(Xyrauchen texanus)* was listed as an endangered species in 1991. Both historically were found in the Colorado River basin, but populations declined due to changes in stream flow and water temperatures, direct loss of habitat due to inundation by reservoirs, blockage of migration routes, and the introduction of non-native fish. Although it is unlikely that either of these fish occur within the Monument's boundaries, Colorado squawfish and razorback suckers do occur in Lake Powell. Management actions within the Monument, if they deplete or degrade water flowing into Lake Powell, could impact these fish.

The Kanab ambersnail *(Oxyloma haydeni kanabensis)*, was listed as an endangered species in 1992. It is extremely rare, known only from a few locations in Utah and Arizona. It has not been documented with the Monument, but may occur there where suitable habitat exists. The Kanab ambersnail is a land snail, but it lives at the edge of water on damp substrates, including on bedrock supporting algae. It may also be found on the stems of semiaquatic plants. Threats to the ambersnail include habitat loss or degradation, and its extremely small population numbers.

Alternative A (No Action)

In this alternative, many areas of the Monument would remain open to motorized or mechanized cross-country travel. The potential for impacts to threatened and endangered species from interactions with people would continue, due to the continued accessibility of much of the Monument. There are currently no known conflicts with threatened or endangered species within the Monument.

Southwestern willow flycatcher habitat in the Escalante River drainages would remain closed to motorized and mechanized use in this alternative. However, this alternative would allow continued motorized and mechanized use of approximately 38 miles of known or potential southwestern willow flycatcher habitat within Paria River riparian areas. If motorized and mechanized use were to increase during the nesting season (May through June), it could reduce nesting success of this species. Any reduction in nesting success could be considered an adverse effect to this species, so mitigating measures would be implemented.

No proposed visitor site facilities (trailheads, trails, interpretive sites, parking areas, etc.) would be constructed if direct or indirect impacts to a listed threatened and endangered species were identified.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument, since visitor use is unrestricted in this alternative. If increased visitation were found to have adverse impacts on threatened and endangered species, mitigating measures, such as closures or allocations, would be implemented.

Research uses in the Monument could have beneficial impacts to threatened and endangered animal species. Beneficial impacts could result from research activities which focus on increasing the knowledge of the threatened and endangered animal species in the Monument, or which result in stabilizing or preserving threatened and endangered animal species. Surface disturbing research activities would be modified to avoid areas with threatened and endangered species, or the research activities would not be permitted.

Livestock grazing could impact threatened and endangered animal species through surface disturbance, streambank disturbance, removal of vegetation, water quality degradation, increased erosion and siltation, trampling, alteration of the composition of vegetative associations, and competition with wildlife. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on threatened and endangered species would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

This alternative would allow new water developments to protect Monument resources, and would allow the maintenance of existing developments, provided Monument resources were protected. Prior to the construction of new or maintenance of existing water developments, clearances would be conducted to identify threatened or endangered species or their habitat.

Maintenance of existing water developments and the construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, would not be permitted if direct impacts to a listed threatened and endangered species were identified. If indirect impacts from water developments were to degrade or fragment habitat, disrupt nesting cycles, or disrupt water sources of threatened or endangered animal species, the maintenance of existing and construction of new water developments would not be permitted.

In conclusion, lack of cross-country vehicle travel restrictions in this alternative would allow potential impacts to threatened and endangered animal species through ground disturbance. This alternative also increases the potential for interactions of threatened and endangered species with humans. However, prior to any action, the BLM would conduct surveys to ensure that those actions would not jeopardize the continued existence of threatened or endangered species.

Alternatives B, C, D, E

Alternatives B, C, D, and E close the Monument to motorized and mechanized cross-country travel. Surface disturbance from cross-country vehicles would therefore not occur, and the potential for impact to threatened and endangered species from interactions with people would be reduced.

Alternatives B, C, D, and E would close portions of the Monument to motorized and mechanized vehicle use on routes. This would afford protection of threatened and endangered animals by reducing access and resultant impacts. This protection would be greatest in Alternative D, with 760 miles of routes designated open, followed by Alternative B, with 818 miles of routes designated open. Alternative C would provide 1,187 miles of routes designated open, and Alternative E would designate 1,264 miles open.

Alternatives B, C, D, and E would continue the closure of the Escalante River drainages to motorized and mechanized vehicle use. Alternatives B, C, and D would also close the Paria River corridor to motorized and mechanized vehicle use. This would prevent any impacts from these uses on threatened and endangered species in those areas. Alternative E would close all but a small portion of the Paria corridor to such use; if conflicts with threatened and endangered species were to occur in the open portion, mitigating measures would be implemented.

Alternatives B, C, D, and E propose construction of visitor site facilities (trailheads, trails, interpretive sites, parking areas, pullouts). None of the construction activities in any of the Alternatives B, C, D, and E would be anticipated to directly or indirectly affect any threatened or endangered animal species in the Monument. Clearances would be conducted prior to any construction. If threatened and endangered species or their habitat were identified, no construction would be allowed.

Population growth locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument. That would increase the impact of visitor use on threatened and endangered species. Specifically, there could be increased interaction with spotted owls and increased interaction with southwestern willow flycatcher populations along riparian areas in popular hiking locations.

Alternative E would have the highest potential for threatened and endangered species to interact with humans, as the management emphasis of this alternative would result in the largest increase in visitor use within the Monument. However, the potential for indirect impacts to threatened and endangered animal species is expected to be limited. Alternative D would have the least potential for interactions with humans, as this alternative would promote/allow the least amount of increase in visitor use within the Monument. Alternatives B and C would each have a moderate level of potential impacts from human interactions.

Alternatives B, C, D, and E allow allocations, which could be used to control visitation as population and tourism pressures increase. This would be used to protect threatened and endangered animal species. Visitor allocations would be most widespread in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed by Alternative B, where allocations could occur on 1,571,162 acres. In Alternative E, allocations could occur on 1,466,541 acres.

Research uses in the Monument could have beneficial impacts to threatened and endangered animal species. Beneficial impacts could result from research activities which focus on increasing the knowledge of the distribution and type of threatened and endangered animal species in the Monument, or which result in stabilizing or preserving threatened and endangered animal species. Research activities which adversely impact threatened and endangered species would not be permitted.

In Alternatives B and C, biological inventories to detect the presence of threatened and endangered species and their habitat would be a high priority, as would management actions to protect those species and their habitat. Research related to those species and threats to them, including habitat restoration research and adaptive management techniques, would be encouraged and supported in both Alternatives B and C. Alternatives D and E would allow such research, but it would not be encouraged and supported to the extent it would in Alternatives B and C.

Livestock grazing could impact threatened and endangered animal species through surface disturbance, streambank disturbance, removal of vegetation, water quality degradation, increased erosion and siltation, trampling, alteration of the composition of vegetative associations, and competition with wildlife. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on threatened and endangered species would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Maintenance of existing water developments, and the construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines and impoundments, would not be permitted if direct impacts to a listed threatened and endangered species were identified. If indirect impacts to threatened or endangered animal species were identified, the maintenance of existing and construction of new water developments would not be permitted. Clearances would be used to identify threatened or endangered animal species or their habitat prior to the construction or maintenance of any new water developments.

Fire management, including suppression activities, would consider and prevent potential impacts to threatened and endangered species, including the Mexican spotted owl and the southwestern willow flycatcher.

In all alternatives, powerlines would be required to meet non-electrocution standards for raptors.

In conclusion, Alternatives B, C, D, and E would not adversely affect threatened and endangered animal species or their habitat. Where threatened and endangered species are known to occur, the BLM would evaluate actions and modify them to ensure that they do not jeopardize the continued existence of the species.

IMPACTS TO THE PAUNSAUGUNT DEER HERD

The Paunsaugunt deer herd is the largest population of trophy class male deer in the western United States.

Impacts to the Paunsaugunt deer herd come primarily from interactions with humans. In particular, deer are sensitive when on their winter range (mid-October to April). During this time, deer are considered susceptible to human interference and physiological stress. Additional impacts include collision with vehicles, habitat destruction, and loss of forage.

Alternative A (No Action)

In this alternative, much of the Paunsaugunt deer herd area would remain open to unregulated cross-country vehicle travel. Lack of limitations on motorized and mechanized use would increase accessibility throughout the herd area.

Construction of visitor site facilities within the deer herd area would be minimal in this alternative. Overall recreational use in the herd area is expected to remain low in this alternative. Significant impacts from habitat loss and human interactions would not be expected.

Population growth, locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument, since visitor use is unrestricted in this alternative. This increased visitation would also increase any adverse impacts of visitation on the Paunsaugunt deer herd.

In conclusion, this alternative would have the greatest impact on the Paunsaugunt deer herd due to lack of cross-country vehicle travel restrictions in the majority of the sensitive herd areas. Unregulated motorized and mechanized vehicle use could result in deer being subjected to human interference and physiological stress.

Alternatives B, C, D, E

Each of the Alternatives B, C, D, and E would eliminate all forms of cross-county vehicle travel within the Paunsaugunt deer herd area. Therefore, adverse habitat impacts from these activities are not anticipated.

Alternative C would eliminate all vehicle access to much of the sensitive deer herd areas, while the remaining area would be accessible only on designated routes. This alternative would result in the least potential for interactions with humans. In particular, this alternative would benefit the herd most during important migration periods and would also eliminate interaction on much of the important winter range.

Alternatives B, D and E would have virtually identical impacts. The majority of the herd area would continue to have vehicle access on designated routes. As a result, these three alternatives afford less protection than Alternative C to the herd, especially during migration times and during herd use of winter range. A greater potential for vehicle collision and animal stress would occur during these periods.

The effects of the construction of visitor facilities, including trailheads, trails, interpretive sites, parking areas, and restrooms would be the same regardless of the alternative (B ,C, D, E). Visitor facilities would result in additional use during periods when deer migration is occurring. Such increased interactions could cause stress-related impacts to the deer herd. Construction of these facilities and associated routes would also destroy a small amount of habitat.

No developed campgrounds are proposed in the deer herd unit and overall recreation use (including dispersed camping and camping in designated primitive sites) in the area would continue to remain low in each of the Alternative B, C, D, and E. The majority of camping use in the deer area is most likely in response to the hunting opportunities associated with this herd. Overall, such use would have a negligible impact on the health of the herd.

In conclusion, Alternatives B, C, D, and E reduce impacts to the Paunsaugunt deer herd by eliminating motorized and mechanized cross-country travel. Alternative C affords the greatest protection to the herd from motorized and mechanized travel. Impacts to the deer herd under the other Alternative B, C, D, and E (B, D, and E) would be virtually identical, since the majority of the herd area would continue to remain accessible to vehicles only on designated routes.

Other Environmental Factors

IMPACTS ON SURFACE WATER QUALITY

Impacts to surface water quality come from cross-country vehicle travel, the use of vehicles on poorly-constructed routes, livestock grazing, and visitor use. The effects of cross-country travel include removal of surface cover (i.e., soil holding vegetation and rocks), displaced soil particles, increased soil compaction, creation of new flow paths and channels, and increased runoff. All of these combine to increase soil erosion and sedimentation of water resources. The effects of travel on poorly-constructed routes are similar to the cross-country effects. Thus, the greater the number of poorly-constructed routes left open, the greater the impacts to surface water quality.

The effects of livestock grazing and visitor use include contamination of water sources by waste products, and sedimentation from soil erosion due to trampling.

Alternative A (No Action)

Much of the Monument would remain open to motorized and mechanized cross-country vehicle travel, and related water quality impacts would continue. As visitation increases, these impacts would also be expected to increase, thereby resulting in a decrease in surface water quality.

Other impacts on water quality are related to recreational use and livestock grazing. Both could result in degradation of water quality due to contamination with waste products, and due to trampling, soil erosion, and subsequent sedimentation.

Construction of visitor site facilities could disturb 8 acres. Impacts to surface water quality from this disturbance would be minimal. Visitor facilities would be constructed in a manner that sediments or other contaminants would not be introduced into water courses.

In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on water quality would be assessed, and if adverse impacts were found, adaptive management measures could be implemented

Population growth locally and nationally, and the growth of tourism regionally, would increase the numbers of people visiting the Monument in this alternative. This would add to the impacts on surface water quality.

Research uses in the Monument could adversely impact surface water quality where research activities cause surface disturbance, which could increase erosion. Research project design would be required to mitigate adverse impacts on water quality.

This alternative would allow the construction of new water developments to protect Monument resources. The construction of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could have both beneficial and adverse effects on surface water quality. Benefits could occur from water developments that move livestock away from springs and streams, decreasing erosion and other water quality problems associated with livestock. Conversely, water development construction activities and trampling associated with the concentration of use around water developments, such as troughs and impoundments, could lead to erosion, which could adversely affect surface water quality. Adverse impacts could also occur if a significant amount of water were piped away from the source, resulting in reduced flow rates or dewatering and subsequent water quality impacts. Impoundments could have an adverse impact by retaining water, which would otherwise flow downstream.

The design and location of water developments would be required to prevent or mitigate adverse impacts to water quality, or the developments would not be permitted.

Water quality degradation would adversely affect biological resources, including plant and animal communities associated with degraded water sources. It could also affect recreational use, if drinking water were to become more difficult to acquire.

In conclusion, lack of cross-country vehicle travel restrictions would allow impacts to surface water quality to continue. It would also increase as use increases. Recreational use would also impact water quality. The resulting water quality impacts would, in turn, adversely effect Monument biological resources and visitor use.

Alternatives B, C, D, E

Alternatives B, C, D, and E close the Monument to motorized and mechanized cross-country travel, and restrict vehicle travel to designated routes. The impacts of travel on poorly-constructed routes would vary in extent, since each alternative designates a different number of miles of open routes.

Other impacts on water quality are related to recreational use and livestock grazing. Either could result in degradation of water quality due to contamination with waste products, from trampling, soil erosion, and sedimentation. Impacts due to recreational use could be mitigated through regulation, interpretation, or other visitor management techniques.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, picnic areas, pullouts, and restrooms ,would create surface disturbance in all alternatives. The least disturbance would occur in Alternatives C and D, disturbing 10 acres each over 15 years. Alternative B would disturb 16 acres, and Alternative E would disturb 22 acres over 15 years. Impacts to surface water quality from this disturbance would be minimal. Visitor facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water courses.

Implementation of visitor allocation systems to limit recreational use could mitigate impacts of increased use. Allocations would be most prevalent in Alternatives C and D, where allocations could be implemented on 1,684,899 acres, followed closely by Alternative B, where allocations could occur on 1,571,162 acres. Allocations could occur on 1,466,541 acres in Alternative E.

Research uses within the Monument could have both beneficial and adverse impacts on water quality. Beneficial effects could result from research which increases our understanding of water quality factors. Research uses could adversely impact surface water quality if research activities were to cause surface disturbance, which could increase erosion. Research project design would be required to mitigate adverse impacts to water quality.

In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the effects of livestock grazing on water quality would be assessed, and if adverse impacts were found, adaptive management measures could be implemented.

Alternatives B and C would allow construction of new water developments only when such developments protect Monument resources. Alternative E would allow the construction of new water developments for the management of livestock, wildlife, or visitor use, in addition to protecting Monument resources. In Alternatives B, C and E, the construction of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could have both beneficial and adverse effects on water quality. Beneficial effects could occur if new water developments move livestock away from springs and streams, decreasing erosion and other water quality problems associated with livestock. Conversely, water development construction activities and trampling associated with the concentration of use around water developments such as troughs and impoundments could lead to erosion, which could adversely affect surface water quality. Alternative D would not allow the construction of water developments.

Adverse impacts could occur if a significant amount of water were piped away from the source, resulting in reduced flow rates or dewatering and subsequent water quality impacts. Impoundments could have an adverse impact by retaining water which would otherwise flow downstream. Adverse impacts would be avoided by the design of the water developments before water developments would be authorized.

Alternatives B, D and E would include water quality monitoring and mitigation in high-risk areas, further reducing the potential for water quality degradation.

In Alternatives B, C and E, the BLM would request and assist the State of Utah in development of TMDLs for the four "Section 303(*d*)" stream segments in the Monument, which could accelerate water quality improvements there.

In conclusion, Alternatives B, C, D, and E would generally benefit surface water quality by reducing vehicle use, and subsequently decreasing erosion and sedimentation. Alternatives B, C, D, and E could control the impacts of increased visitor use through allocation systems. Alternatives B, D and E could address water quality degradation through a monitoring and mitigation program.

IMPACTS ON AIR QUALITY

Impacts on air quality come primarily from sources outside the Monument. However, short-term air quality effects could arise from vehicle use on dirt routes, and from wind-blown dust.

Alternative A (No Action)

The Monument currently is an attainment area for the National Ambient Air Quality Standards (NAAQS) and is Class II under the Federal Prevention of Significant Deterioration (PSD) program. The Monument is surrounded by Class I areas: Bryce Canyon National Park is on the northwest boundary; Zion National Park is nearby to the southwest, and Capitol Reef National Park is on the northeast boundary.

Air quality within the Monument meets national standards. Anticipated construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.

Increases in population and development regionally could have an impact on Monument air quality. If Monument air quality were to deteriorate, visitor experiences would be impacted, and biological and cultural resources could be impacted. However, the location of the Monument, surrounded by Class I areas, could effectively limit that deterioration in and around the Monument.

Alternatives B, C, D, E

In Alternative D, the BLM would pursue obtaining a PSD Class I Air Quality redesignation for the Monument. This objective could be reached by working with the State of Utah to pursue redesignation legislation. In Alternatives B, C, and E, redesignation would not be pursued. Alternative D could provide additional protection of Monument air quality in the long-term, although the presence of Class I areas surrounding the Monument could have the same effect.

In Alternatives B, C, D, and E, the anticipated levels of construction, and of vehicle use on unpaved routes, would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.

In conclusion, although regional growth and development could result in air quality degradation, none of the alternatives would contribute to that degradation. Alternative D, which proposed to pursue redesignation to Class I, could protect against air quality degradation, although the protection could be inconsequential.

IMPACTS ON WILD AND SCENIC RIVER VALUES

Impacts on Wild and Scenic River values would come from development actions that would diminish the outstandingly remarkable values and free flowing values that make the river eligible. These potential impacts are described below.

Alternative A (No Action)

In this alternative, all 25 eligible river segments would remain eligible and would not be considered for suitability, but would remain indefinitely under protective management. This protective management is subject to valid existing rights and to actions within the BLM's authority. It consists of a case-by-case review of proposed actions to assure that outstandingly remarkable values and the free flowing values are considered in evaluating proposed actions.

This alternative would assure consideration in future decision making of the values and characteristics that make the river segments eligible.

Alternatives B, C, D, E

Designation of specific river segments to the National Wild and Scenic Rivers System is possible under Alternatives B, D, and E. The number of segments recommended as suitable varies by alternative. Alternatives B and E would each include 252 miles of river recommended as suitable. Alternative D would recommend all eligible segments as suitable, for a total of 330 miles. Alternative C would recommend none of the eligible segments as suitable.

Alternatives B, D, and E would maintain the outstandingly remarkable values and free flowing values for the segments recommended as suitable in each alternative. Alternative C would not specifically protect outstandingly remarkable values and free flowing values, but through management prescriptions aimed at protecting Monument resources, would likely prevent significant degradation of the outstandingly remarkable values for eligible segments. The BLM does not anticipate any changes to the free-flowing characteristics of these rivers to the degree that they would affect eligibility/suitability.

While the BLM makes recommendations for inclusion into the National Wild and Scenic River System, only Congress or the Secretary, upon application of the Governor, could designate a river to the National Wild and Scenic River System. Actual designations, if any, may or may not follow the recommendations made in this document.

If designated, the values that make these stream segments eligible for congressional or administrative designation into the Wild and Scenic River System would be protected by management prescriptions in this plan or a subsequent river management plan that would limit potential surface disturbance for the ½ mile-wide corridor. The values and characteristics that make the segments eligible and suitable for potential congressional designation would be maintained by the plan's management prescriptions.

Monument Uses and Users

IMPACTS ON RESEARCH ACTIVITIES

Research opportunities in the Monument would be affected by the access and management features of alternatives. For example, research opportunities related to functioning ecosystems may be enhanced by non-surface disturbing activities and minimum recreation. Conversely, surface-disturbing research such as excavations of archaeological and paleontological sites might best be accommodated through alternatives that provide more access for researchers. All types of research might benefit from research-oriented management strategies.

Alternative A (No Action)

Cross-country travel using motorized and mechanized vehicles could occur on large portions of the Monument. Cross-country vehicle use would be limited to existing routes on about 15 percent of the Monument, and 4 percent of the Monument would be closed to cross-country vehicle use. This alternative would allow vehicular access to more areas than any other alternative, thereby enhancing accessibility for research activities. It would also allow greater numbers of visitors to more areas of the Monument, thereby detracting from ecosystem and land management-based research to the extent that they depend upon intact Monument resources.

Animal damage control activities would directly impact research related to wildlife populations and to natural systems by removing animals from those populations and systems. This could affect the validity of the research result, and could reduce the value of the Monument for such research.

In conclusion, although this alternative provides the greatest access for research, it also provides the least protection for the research value of Monument resources.

Alternatives B, C, D, E

In Alternatives B, C, D, and E, the Monument would be closed to motorized and mechanized cross-country travel. This would protect resources from degradation from increased visitor access by cross-country vehicles. It would also reduce the accessibility of portions of the Monument to researchers.

Animal damage control activities would directly impact research related to wildlife populations and to natural systems by removing animals from those populations and systems. This could affect the validity of the research result, and could reduce the value of the Monument for such research. Compared to Alternative A, Alternatives B, C, D, and E would have less impact on research activities, because all restrict animal damage control activities more than Alternative A. In addition, Alternatives B and C require other measures be exhausted prior to using animal damage control activities. Research might benefit from opportunities to study the effectiveness of other measures to control predators in Alternatives B and C. Alternative D would not impact research activities, because it would not include animal damage control activities. Administratively, research would be best facilitated in Alternative C, as Monument management would focus on maximizing opportunities for research, and research would tend to take precedence over other uses when conflicts among them occur. Alternative B could also maximize opportunities for research, but would not necessarily give research precedence over other uses when conflicts occur.

Alternatives B, C, D, and E would all protect the research value of Monument resources. Alternative C would provide the greatest administrative support for research, followed by Alternative B.

IMPACTS ON LIVESTOCK OPERATIONS

Livestock operations occur throughout the Monument. Impacts to livestock operators come from interactions with visitors, access provisions, and other management factors.

Alternative A (No Action)

Cross-country motorized travel and more open access on existing routes would facilitate livestock management. Greater access would also increase the interaction of the public with livestock, and with fences, corrals, and water developments. It is likely that livestock would be harassed, that gates would be inappropriately left open or closed, and that range improvements would be damaged by the public in this alternative

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because visitor access would be less restricted.

Permitting water development when necessary to protect Monument resources could benefit livestock operations by providing new water sources to help meet resource condition objectives.

Animal damage control activities could directly impact livestock operations by removing animals known to have killed livestock. This could reduce predation on livestock.

Alternatives B, C, D, E

The type and availability of access are significant factors relative to measuring impacts on livestock operations. Alternatives B, C, D, and E would place various limitations on both public vehicle access and on administrative vehicle access that might be available to the livestock operator. Greater administrative vehicle access would facilitate livestock operations, while reduced vehicle access for the general public would reduce livestock harassment, damage to range improvements, and gate problems associated with public access.

Administrative vehicle access would be granted on a case-by-case basis. However, the potential for administrative access would be greatest in Alternative B, followed by Alternative C, and Alternative E. Alternative D would provide the least potential for administrative vehicle access.

Public vehicle access would be least in Alternative D, with 760 miles of routes designated open, followed closely by Alternative B, with 818 miles designated open. Alternative C (1,187 miles open), and Alternative E (1,264 miles open) would provide more public vehicle access than B or D.

Alternatives B, C, and E do not preclude providing new water sources for livestock outside of riparian areas. The replacement of old water developments and the development of new ones could help in achieving resource condition objectives. Alternative D would preclude new water developments.

In Alternatives B, C, D, and E, animal damage control activities would directly impact livestock operations by removing animals known to have killed livestock. This could reduce predation on livestock. Alternatives B and C restrict animal damage control activities, while making greater use of other measures to prevent predation. Although the resultant impacts cannot be determined now, it is possible that livestock operations could benefit from improved management practices that result from actions in Alternatives B and C. Alternative E would restrict animal damage control activities, compared to Alternative A. Alternative D would preclude animal damage control activities.

In conclusion, Alternative B could benefit livestock operators through its access provisions. Alternatives C, D, and E may have fewer impacts to livestock operators due to fewer access provisions. Construction of new water developments to achieve resource condition objectives would be unavailable in Alternative D, possible under limited conditions in Alternatives B and C, and least restricted in Alternative E.

IMPACTS ON FORESTRY PRODUCT USE

The collection of forestry products in the Monument is limited to designated areas and is by permit. Current use is low. Actual cutting areas would be determined under a permit system, and would be the same in all of the alternatives. No commercial collection of products would be allowed, except as authorized in designated areas for resource management objectives. Impacts to these activities come from restrictions to travel off designated routes, limits on location of collection, and by restrictions on non-commercial collection. It is assumed that restrictions on cross-country vehicle use

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could directly affect these activities, as described below.

Alternative A (No Action)

Cross-country travel could occur on a large portion of the Monument. Fuelwood cutting areas would be designated in areas where motorized access is designated. This alternative would not restrict travel in fuelwood cutting areas and would therefore facilitate easy collection of forestry products.

Alternatives B, C, D, E

In Alternatives B, C, D and E, the Monument would be closed to motorized and mechanized cross-country travel. These restrictions could limit forestry product collection activities to travel on designated routes, making it difficult to access areas and load products in vehicles.

IMPACTS ON RECREATIONAL USE

Visitors come to the Monument for many reasons and have a variety of expectations. Some people are attracted to the area for its opportunities for a primitive experience. Others desire motorized and mechanized recreation, either in groups or as individuals. Still others may wish to hunt or fish, study, or become educated about Monument resources.

Alternative A (No Action)

The current level of cross-country vehicle use in the Monument is low, but has been increasing. Overall visitor use is expected to increase, resulting in increased encounters between cross-country vehicles and other users. Two informal all-terrain vehicle (ATV) "play" areas are currently used by cross-country vehicle enthusiasts; these areas would not be affected by this alternative. In this alternative, cross-country travel would be prohibited on 4 percent of the Monument) and would be limited to existing routes on 15 percent of the Monument. This could result in conflicts between motorized and mechanized recreation users and other visitors.

Construction of 16 visitor site facilities (including trailheads, trails, parking areas, pullouts, and restrooms) is possible in this alternative. These facilities would provide for visitor safety and use.

Completion of Calf Creek camping area would allow for a small increase in visitor numbers. The 21 existing designated primitive campsites would be continued. These facilities and areas would likely become overcrowded with increased visitation, decreasing the quality of the visitor experience.

No limitations on group size would be implemented in this alternative. This could impact a visitor's experience due to the increased noise and visual impacts of large groups.

Livestock grazing could impact recreational use by contaminating water sources, altering vegetation, and by aesthetic effects. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the compatibility of livestock grazing with other land uses, including recreation, would be evaluated, and measures could be taken to resolve conflicts.

Animal damage control activities would directly impact visitor experience if the activities were observed by visitors. Animal damage control activities would indirectly impact visitor experience by removing animals which form part of the experience visitors may seek.

In conclusion, this alternative would result in the greatest number of unrestricted uses, with the fewest developments to support these uses. Crowding would likely occur in developed areas and on trails. Lack of group size limits would impact visitor experience due to the noise and visual impacts of large groups.

Alternatives B, C, D, E

None of Alternatives B, C, D, and E allow motorized or mechanized cross-country travel in the Monument.

In Alternatives B, C, D, and E, all routes would be closed to motorized or mechanized vehicle use unless designated open. Alternative E would provide the greatest mileage of open routes, with 1,264 miles designated open. Alternative C would designate 1,187 miles open, while Alternative B would designate 818 open. Alternative D would designate the fewest miles of open routes, at 760 miles open.

Alternatives B and E would designate some routes as open to non-street-legal ATV and dirt-bikes. Alternative B would allow ATV use on 591 miles of the 818 miles designated open. Alternative E would allow ATV use on 980 miles of the 1,264 miles designated open. Alternatives C and D would provide no routes for non-street legal ATV or dirt bike use.

Alternatives B, C, and D would close the Paria River corridor to all forms of motorized and mechanized travel. Alternative E would close the Paria River corridor except for the section through the Paria Box.

Construction of visitor facilities, including trailheads, trails, interpretive sites, parking areas, and restrooms within the Monument would provide limited services for visitors. Facilities would concentrate visitors at these locations. Alternatives B, C, D, and E would increase the number of visitor sites and facilities (Alternative E - 43 total sites, Alternative B - 32, Alternative C - 20, and Alternative D - 20).

There would be no new developed campgrounds in Alternatives B, C and D, although there would be designated primitive campsites in each alternative. Alternatives C and D would each provide 13 designated primitive campsites, while Alternative B would provide 9 designated primitive campsites. Keeping developed and designated camping opportunities at a minimum in the Monument would direct visitors to commercial sites near communities.

Limitation of group size could affect visitor experiences in a variety of ways. Groups would be limited to 12 people and/or animals in the majority of the Monument in Alternatives B, D, and E, thereby lessening the social encounters that any individual group could have. This could benefit those seeking primitive experiences, but could impact those visitors wanting large group recreational experiences. In all alternatives, allocations on visitor numbers could be implemented to manage use levels or to protect Monument resources.

Animal damage control activities would directly impact visitor experience if the activities were observed by visitors. Animal damage control activities would indirectly impact visitor experience by removing animals which form part of the experience visitors may seek. Alternatives B, C, D, and E would have less impact on the visitor experience because all restrict animal damage control activities. Alternative D would not impact the visitor experience, because it would not include animal damage control activities. Alternatives B, C, and E all place restrictions on animal damage control; in addition, B and C require other measures be exhausted prior to using animal damage control activities. Alternatives B, C, and E would impact the visitor experience, but not to the extent Alternative A would.

Livestock grazing could impact recreational use by contaminating water sources, altering vegetation, and by aesthetic effects. On the other hand, some visitors enjoy viewing livestock and livestock operations. In all alternatives, livestock grazing uses within the Monument would be managed in keeping with applicable laws and regulations, and with the statewide Standards and Guidelines. The process which would be used, and the schedule for its completion, are described in Chapter 2. As part of that process, the compatibility of livestock grazing with other land uses, including recreation, would be evaluated, and measures could be taken to resolve conflicts.

In conclusion, a variety of recreational opportunities would be available to a degree under all the Alternative B, C, D, and E. Access to the widest range of experiences, however, would be available in Alternatives B and E, since more interpretive sites and facilities would be developed. Alternative D would be the most restrictive to motorized and mechanized forms of recreation, but would provide visitors with the most opportunities for primitive experiences.

IMPACTS ON OUTFITTERS AND GUIDES

Alternative A (No Action)

Existing outfitter and guide permits would be allowed throughout the Monument in this alternative. Consistent with the Interim Guidance, however, no new outfitter or guide permits would be issued. Group size limits and allocations do not currently apply and thus would not affect outfitter and guide operators.

Existing outfitters and guides would likely benefit the most in this alternative because new, competing permits would not be issued, and conversely, new outfitters and guides would be harmed. Existing outfitters and guides could not, however, expand their operations.

Alternatives B, C, D, E

Outfitters and guides would be permitted to varying degrees in Alternatives B, C, D, and E. Alternatives B, D, and E would allow permits for outfitter and guide operations throughout the entire Monument as long as the activity was appropriate to the management zone. Alternative D could have some areas identified where visitors would only be allowed with a designated outfitter or guide. Alternative C would permit outfitter and guide operations on the majority of the Monument, but would not allow outfitter and guide activities in the remainder of the Monument. In Alternatives B, C, D, and E, outfitter and guides would have to comply with the prescriptions that apply to each management zone, including access restrictions and group size limits. Allocations would apply to outfitters and guides in the zones where allocations could be used as a management tool.

Alternative E would likely benefit outfitters and guides the most because it would generate the highest visitation, would have the largest group size limit in the more heavily used zones, and would provide a wide array of recreational experience zones within which the outfitters and guides could operate. Alternatives B and D would allow outfitters and guides to operate by permit across the Monument, but would place restrictions on motorized access across a larger area and would have lower group size limits in the intensive zones. This could limit outfitters and guides offering motorized and/or large group outings, but could benefit those offering primitive guided experiences. Alternative C would allow outfitter and guide operations on a slightly smaller amount of the Monument, but would designate more routes open for motorized travel and would allow a moderate group size limit in the more heavily used zones.

IMPACTS ON SCENIC QUALITY

Scenic quality is impacted by surface disturbance, which creates a contrast with the natural environment. All alternatives would impact scenic quality to varying degrees of magnitude as described below. The greater the amount of ground disturbance the greater the impact to scenic quality. It is assumed that an increase in visitation could directly and indirectly affect these resources.

Alternative A (No Action)

Motorized and mechanized cross-country travel would be allowed throughout many areas of the Monument. This use could potentially creating more noticeable intrusions which could detract from the scenic quality. Four percent of the Monument would remain closed to cross-country vehicle travel.

Construction of visitor site facilities such as trailheads, interpretive sites, parking areas, pullouts, and restrooms create surface disturbance. This alternative proposes the fewest number of visitor site facilities. Small recreation sites built within the Monument could detract from the scenic quality. The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of facility design and placement. Visitor facilities would be designed to mitigate impacts and conform to the assigned visual resource management class objective. For this alternative, 8 acres of disturbance would occur from construction, which is less than in Alternatives B, C, D, and E.

Use of visitor site facilities would concentrate visitors. Projected increases in use in these areas would increase impacts to scenic quality. Group size, although not a principal factor impacting scenic quality, could be an impact to other visitors if large groups concentrate in areas of high scenic value. With no group size limits or allocation proposed, this alternative has the potential to adversely impact to scenic quality.

The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could adversely impact scenic quality. These impacts would occur primarily through surface disturbing construction, water developments which contrast with the characteristic landscape, and visual contrasts in vegetation associated with the concentration of use in the immediate vicinity of some water developments. Water developments which replace old developments and which contrast with the landscape could improve scenic quality.

The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of water developments. Water developments would be designed to mitigate impacts and conform to the assigned Visual Resource Management Class objective. Maintenance of existing water developments could disturb, damage or destroy scenic quality through surface disturbing maintenance activities or surface disturbance caused by cross-country access with mechanized vehicles. The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of water developments. Water developments would be designed to mitigate impacts and conform to the assigned Visual Resource Management Class objective.

Research uses in the Monument could adversely impact scenic quality where research activities cause surface disturbance. The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of research projects to scenic quality. Research design proposals would be required to mitigate impacts to scenic quality and conform to the assigned Visual Resource Management Class objective.

In conclusion, this alternative would have an impact on scenic quality. Protection of scenic quality from cross-country vehicle use would only occur on 4 percent of the Monument. Total surface disturbance from construction of visitor facilities would be 8 acres.

Alternatives B, C, D, E

Designated routes would be open to motorized and mechanized use in Alternatives B, C, D, and E, but all alternatives would close the Monument to motorized and mechanized cross-country travel. These restrictions protect scenic quality from impacts of surface disturbance caused by cross-country vehicle use and associated increased access.

Construction of visitor site facilities, such as trailheads, interpretive sites, parking areas, pullouts, and restrooms, create surface disturbance. The greater the number of facilities proposed, the greater the potential impacts to scenic quality. The greatest amount of disturbance would occur in Alternative E (22 acres), followed by Alternative B (16 acres), Alternative C (10 acres), and Alternative D (10 acres). The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of facility design and placement. Visitor facilities would be designed to mitigate impacts and conform to the assigned Visual Resource Management Class objective.

Developed campgrounds and designated primitive campsites would affect scenic quality. The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of campground design and placement. Campgrounds and campsites would be designed to mitigate impacts and conform to the assigned Visual Resource Management Class objective. The greater the size of the campground or the greater the number of designated areas, the greater the impacts to scenic quality. In Alternative E it is assumed that one developed campground would be built, disturbing 15 acres. No other alternative would allow construction of developed campgrounds. Alternatives C and D could designate 13 primitive campsites, each disturbing 26 acres. Alternative B would designate 9 primitive campsites, disturbing 18 acres. Alternative E would designate 3 primitive campsites, disturbing 6 acres.

As described above, the various alternatives propose construction of facilities and campgrounds. Subsequent use of visitor site facilities and campgrounds would concentrate visitors. This could result in impacts to scenic quality around facilities. Projected increases in use in areas of existing and new facilities would increase impacts in these areas. Group size, although not a principal factor impacting scenic quality, could be an impact to other visitors if groups concentrate in areas of high scenic value. All alternatives limit group size to 12 in varying areas. Alternative D limits group size to 12 in the greatest areas followed by Alternatives B, E, and C respectively.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources, Alternative D would authorize no new water developments, and Alternative E would authorize new water developments for the protection of Monument resources, for the management of livestock, wildlife, or visitor use. In Alternatives B, C, and E, impacts to scenic quality could result from surface disturbing construction, water developments which contrast with the characteristic landscape, and visual contrasts in vegetation associated with the concentration of use in the immediate vicinity of some water development such as troughs or impoundments. On the other hand, water developments that replaced old developments that contrast with the landscape could improve scenic quality.

The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of water developments. Water developments would be designed to mitigate impacts and conform to the assigned Visual Resource Management Class objective.

Maintenance of existing water developments in Alternative B, C, D and E could disturb, damage or destroy scenic quality through surface disturbing maintenance activities. The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of water developments. Water developments would be designed to mitigate impacts and conform to the assigned Visual Resource Management Class objective.

Research uses in the Monument could adversely impact scenic quality where research activities cause surface disturbance which creates widely visible visual contrasts. The visual resource contrast rating system would be utilized as a guide to analyze potential visual impacts of research projects to scenic quality. Research design proposals would be required to mitigate impacts to scenic quality and conform to the assigned Visual Resource Management Class objective.

In conclusion, protection of scenic quality from the impacts of vehicle use would be greatest in Alternative D, followed by Alternatives B, E, and C. Total surface disturbance from construction of visitor facilities, campgrounds, and designated campsites would be greatest in Alternative E, followed by Alternatives C, D, and B. Visitor impacts would be greatest in Alternative E, followed by B, and least likely to occur in Alternatives C and D because Alternative E has the least controls on group size and allocations followed by B, C, and D respectively.

IMPACTS ON PRIMITIVE UNCONFINED VALUES

Primitive unconfined values include naturalness, solitude, or a primitive and unconfined type of recreation. Primitive unconfined values are impacted by noticeable imprints of humans, recreation that requires motorized and mechanized equipment or facilities, and the ability of a user to find a secluded spot.

Alternative A (No Action)

This alternative would allow motorized and mechanized cross-country travel throughout many areas of the Monument. Cross-country motorized and mechanized use impacts primitive unconfined values by creating new trails and impacting naturalness, resulting in fragmentation of otherwise large contiguous areas. Therefore, opportunities for primitive unconfined values would not be protected from the sights and sounds of motorized and mechanized recreation. Effects on primitive unconfined values from increased use, and subsequent increased noise of dirt bikes and cross-country vehicles, would be high under this alternative.

Construction of visitor site facilities could concentrate visitor use at the developed sites and reduce impacts on primitive unconfined values in the rest of the Monument.

Not limiting group sizes could increase the impacts on naturalness if large groups concentrate in campsites or on trails. Larger groups would negatively impact solitude in areas with primitive unconfined values, although effects would be based on the numbers of groups and numbers of encounters, not just group size. Because group size limits and allocations would not be used, impacts from visitor use are expected to be greatest in this alternative.

Research uses in the Monument could adversely impact primitive and unconfined values where research activities cause surface disturbance. Research project design would be required to mitigate adverse impacts.

The construction, maintenance, and subsequent use of new water developments, such as spring developments, troughs, pumps, pipelines, and impoundments, could adversely impact primitive and unconfined values of naturalness. Adverse impacts to elements of naturalness would occur primarily through surface disturbing construction, and the direct impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Maintenance of existing water developments could disturb, damage or destroy primitive and unconfined values of naturalness through surface disturbing maintenance activities.

In conclusion, lack of cross-country vehicle restrictions and unlimited access in this alternative would affect primitive unconfined values. Large portions of the Monument would not be protected from the sights and sounds of motorized and mechanized recreation. This alternative would result in the greatest visitor use with the fewest restrictions, and would therefore provide the least opportunities for a primitive, unconfined experience.

Alternatives B, C, D, E

Alternatives B, C, D, and E would not allow motorized and mechanized cross-country travel in the Monument. Routes for motorized and mechanized use would be designated in all alternatives. These restrictions would protect parts of the Monument from visitor impacts to primitive unconfined values by increasing opportunities for solitude and naturalness. Protection of primitive unconfined values from sights and sounds of motorized and mechanized use would be the greatest in Alternative D, followed by Alternative B, Alternative C, and Alternative E.

Construction of visitor site facilities such as trailheads, trails, interpretive sites, parking areas, and restrooms could concentrate visitor use and reduce impacts on primitive unconfined values in the rest of the Monument. In Alternatives B, C, D, and E, developed campgrounds and designated primitive campsites would encourage concentrated use in developed and designated areas. This would enhance primitive unconfined values opportunities in other areas of the Monument.

Group size would be limited to no more than 12 people and/or animals on portions of the Monument in all alternatives. Limitations on visitor group size would partially mitigate the impacts of increased visitor use. These limits cover the greatest area in Alternative D, followed by Alternatives B, E, and C.

Research uses in the Monument could adversely impact primitive and unconfined values where research activities cause surface disturbance. Research project design would be required to mitigate adverse impacts.

Alternatives B and C would authorize new water developments only when necessary for the protection of Monument resources. Alternative D would authorize no new water developments. Alternative E would authorize new water developments for the protection of Monument resources, or for the management of livestock, wildlife, or visitor use. The disturbance, damage, or destruction of primitive and unconfined values in Alternatives B, C, and E could result from surface disturbing construction, and impacts associated with the subsequent concentration of use in the immediate vicinity of some water developments, such as troughs or impoundments. Impacts to primitive and unconfined values in Alternative B, C, and E would be mitigated through a clearance process that would consider primitive and unconfined values in the decision. Mitigation of impacts to primitive and unconfined values in Alternative D would not be necessary since no new water developments would be authorized. Maintenance of existing water developments in Alternative B, C, D and E could disturb, damage, or destroy primitive and unconfined values through surface disturbing maintenance activities. Mitigation of maintenance impacts to primitive and unconfined values would be considered by performing a clearance prior to authorizing maintenance activities.

In conclusion, Alternative D would provide the greatest protection to primitive unconfined values by providing the largest contiguous area where these values are protected from large group size, motorized and mechanized vehicular access, and other visitor impacts. Alternatives B and E would provide substantial protection to primitive unconfined values. Alternative C would provide the least protection to primitive unconfined values.

IMPACTS ON LOCAL ECONOMIES

The Monument Planning Office contracted with the Utah Governor's Office of Planning and Budget to provide data and analysis relating to the economic and social impacts of the Monument management alternatives for inclusion in this Draft Management Plan and Draft Environmental Impact Statement. The Utah Governor's Office of Planning and Budget report presented background data on the economics and demographics of the region surrounding the Monument, and detailed the process and results of the analysis of socio-economic impacts from the management plan alternatives. Detailed information about these projections could be found in Appendix 19.

The impacts of the alternatives are driven by BLM spending and employment, as well as visitor spending. The direct, indirect, and induced effects of this direct employment and spending on population, employment, employee earnings, and local government revenues in southwest Utah are the focus of the analysis. Key findings of the analysis follow.

Overall impacts of the plan alternatives on the southwestern Utah population base are relatively small. The various management alternatives could add between six and 544 persons to a total population base of 212,603 in the year 2012. Peak population impacts occur in the year 2000, during construction of new Monument facilities, when the additional population base could range between 554 and 961. After construction activities cease, population increases would range between a loss of 10 to a gain of 28, depending upon the alternative considered.

Employment attributable to Monument activities is expected to peak during facility construction in the year 2000, when Monument activities could add between 351 and 615 jobs to an employment base of 74,457 in southwestern Utah. Total employment impacts attributable to the Monument in the year 2012 range from -1 to 248 added to a total employment base of 116,129. After construction activities cease, employment increases would range between a loss of 10 jobs to a gain of 18 jobs annually, depending upon the alternative considered.

For the most part, unchanging direct employment by the BLM results in a fairly steady earning stream throughout the study period analyzed. However, during facility construction the highest earnings are generated, ranging from $10.8 million to $18.4 million in the year 2000, depending upon the alternative considered. After construction, earnings stay quite steady, ranging between $1.4 million and $7.9 million in the year 2012.

Net revenues to local governments remain relatively small, again with the construction activities in the year 2000 providing the peak revenue stream. In 2000, net revenues could range between $351,000 and $565,000. Because this item is so dependent upon projected visitation numbers, the assumptions made for the various alternatives produce a wide range of results by the year 2012, when net revenues range between a loss of $36,000 to a positive $330,000. This is a small proportion of expected local government revenues which total in the tens of millions of dollars.

Alternative A (No Action)

The annual growth rate in visitation would be 4.7 percent in this alternative, with 217,190 visitor days in 1998, growing to 414,764 visitor days in 2012. Regional population growth attributable to this alternative would be 370 people in 2012. By 2012, the additional employment generated by this alternative would be 219 jobs, with employee earnings reaching $6,001,000 in that year. Local government revenues attributable to this alternative would be $516,000 in 2012, with expenditures of $317,000, for a net revenue of $199,000 to local governments.

Alternative B (Preferred)

The annual growth in visitation in this alternative would be 5.2 percent, with 442,633 visitor days in 2012, 6.7 percent higher than Alternative A. Regional population growth attributable to this alternative would be 422 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 248 jobs, compared to 219 in Alternative A. Employee earnings would reach $6,636,000 in 2012, 10.6 percent higher than Alternative A. Local government revenues attributable to this alternative would be $ 598,000 in 2012, with expenditures of $362,000, for a net revenue of $236,000 to local governments, 18.6 percent higher than in Alternative A.

Alternative C

The annual growth in visitation in this alternative would be 3.7 percent, with 358,274 visitor days in 2012, 13.6 percent lower than Alternative A. Regional population growth attributable to this alternative would be 282 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 163 jobs, compared to 219 in Alternative A. Employee earnings would reach $3,828,000 in 2012, 36 percent less than Alternative A. Local government revenues attributable to this alternative would be $288,000 in 2012, with expenditures of $245,000, for a net revenue of $236,000 to local governments, 78 percent lower than the No Action Alternative.

Alternative D

The annual growth in visitation in this alternative would be 1.2 percent, with 248,055 visitor days in 2012, 40 percent lower than Alternative A. Regional population growth attributable to this alternative would be 6 people in 2012, compared to 370 people in Alternative A. By 2012, this alternative would show a net loss of 1 job, compared to an increase of 219 jobs in Alternative A. Employee earnings would reach $1,480,000 in 2012, 75 percent less than Alternative A. Local government revenues attributable to this alternative in 2012 would be less than expenditures, for a net revenue deficit of $36,000.

Alternative E

The annual growth in visitation in this alternative would be 6.3 percent, with 519,208 visitor days in 2012, 25 percent higher than Alternative A. Regional population growth attributable to this alternative would be 544 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 324 jobs, compared to 219 in Alternative A. Employee earnings would reach $7,963,000 in 2012, 32.7 percent higher than Alternative A. Local government revenues attributable to this alternative would be $792,000 in 2012, with expenditures of $462,000, for a net revenue of $330,000 to local governments, 65.8 percent higher than in Alternative A.

In conclusion, Grand Staircase-Escalante National Monument is a large block of land located in a very sparsely settled area. All proposed management alternatives are driven by a basic intent to keep most of the landscape in its current condition, with very little new development expected. The steady operating budget, constant employee base, and fixed facility locations result in little variation between alternatives and over time. Overall, the impacts of the management alternatives are positive but small. Impacts to local government revenues and expenditures are also positive but relatively small.

The available economic information and analytical models are not specific to the Monument, but cover all of southwestern Utah as is appropriate for impact assessment purposes.

Cumulative Impacts

INTRODUCTION

Cumulative impacts are the effects on the environment which result from the incremental impact of any one of the alternatives in combination with other past, present, and reasonably foreseeable future actions outside the scope of this plan, either within the Monument or outside it.

Cumulative impacts are discussed because the quality of the human environment is the result of many different factors, acting together. The real effect of any single action cannot be determined by considering that action in isolation, but must be determined by considering the likely result of that action when acting in conjunction with many others. These involve determinations that are of necessity complex, and are to some degree intuitive.

The cumulative impacts discussion which follows considers the alternatives in the context of the broader human environment. It includes a discussion of the factors such as livestock grazing that have brought that environment to its current state, and a discussion of factors such as population growth that could be expected to influence that environment in the future.

Data on the precise locations and overall extent of Monument resources, while considerable, varies according to resource type and locale. Further, our understanding of the impacts on and the interplay among these resources is evolving. As our data base and knowledge improves, adaptive management measures would be considered to reduce potential cumulative impacts in accordance with law, regulation, and the Final Monument Management Plan.

BACKGROUND

In the late 19th century, the small communities at the perimeter of the Monument experienced rapid growth. Most settlers were supported by livestock grazing or associated occupations such as freighting and merchandising. Some settlers capitalized on the timber from nearby plateaus, and established small sawmill operations. Higher than normal precipitation patterns and the native grasses of the region supported growing numbers of livestock and settlers. This 20 year growth pattern came to a halt near the turn of the century when overgrazing, declines in wool and beef prices, and drought combined to force many residents to leave the region. This out-migration continued through much of the 20th century, with occasional booms brought on by activities such as movie making, uranium exploration and mining, and the construction of Glen Canyon Dam. As a result, the landscape today includes hundreds of miles of rough routes developed for settlement and for mineral exploration; it includes a producing oil field; some active mines and numerous abandoned mines; fences, corrals, cabins, water developments, and altered vegetation associated with over a century of livestock grazing; and new communities associated with Glen Canyon Dam and with Lake Powell, which is clearly visible to the south.

Livestock grazing in the region has evolved and changed considerably since it began in the 1860s. From that beginning, the number of cattle, sheep, and horses increased rapidly. At the turn of the century, large herds of livestock grazed on unreserved public domain in uncontrolled open range. Because the experience of stockmen was in more temperate climates, they knew little about the carrying capacity of these arid lands. Consequently, the range was stocked beyond its capacity, causing changes in plant, soil, and water relationships. Some speculate that the changes were permanent and irreversible, turning plant communities from grass and herbaceous species to brush and trees, which were less palatable to domestic livestock grazing animals. Protective vegetative cover was reduced, so less water infiltrated the soils. More runoff brought erosion, rills and gullies. Livestock grazing effects were pronounced in riparian areas, where results included reductions in understory vegetation, bank erosion, increased sedimentation in streams, and the introduction of weeds. In extreme situations, dewatering resulted from gully cutting which lowered water tables and dried up riparian areas and meadows.

In response to these problems, livestock grazing reform began in 1934 with the passage of the Taylor Grazing Act. Subsequent laws, regulations, and policy changes have resulted in adjustments in livestock numbers, season-of-use changes, and other management changes.

The Proclamation which established the Monument stated that "...grazing use shall continue to be governed by applicable laws and regulations". Livestock grazing regulations were most recently revised in 1995, leading to the adoption, in 1997, of the Standards and Guidelines for Rangeland Health, which are now beginning to be applied statewide, including within the Monument. The new regulations, and the Standards for Rangeland Health and Guidelines for Grazing Management, give management priority to maintaining functioning ecosystems. Although they are just beginning to be implemented, it is likely that the new regulations, Standards, and Guidelines would have a beneficial effect on Monument resources over time.

There are currently two coal leaseholds and 80 active oil and gas leases within the Monument. Part of the Upper Valley Oil Field, a producing oil field, is within the Monument. Nevertheless, coal mining and oil and gas development within the Monument are not considered likely. The Upper Valley Oil Field appears to be anomalous, rather than indicative of conditions elsewhere in the Monument (see Chapter 2, Alternatives Considered But Eliminated).

There are 71 mining claims within the Monument. Of these, six are considered "active". Five of the "active" permitted mining operations are alabaster/gypsum mines; the sixth is a titanium/zirconium claim. The Proclamation closed the Monument to any new mining claims, but valid rights existing at the time of the Proclamation may be exercised. If existing mining claims were developed, the effects could range from minor to profound, depending on the level of development, the location, and numerous other factors. Such development is considered unlikely.

The lands adjacent to the Monument are generally federal lands, managed by the BLM, the U.S. Forest Service, and the National Park Service. Management of those lands is likely to protect Monument resources. However, it is possible that land uses on the Dixie National Forest north of the Monument could effect water quality within the Monument, if livestock grazing, logging, and roads there were to increase sediment loads in streams, or effect other features of the watershed. It is also possible, in the long term, that the heavy visitation associated with the National Parks and National Recreation Area around the Monument would effect the Monument, both by "overflow" visitation, and through visitor-related developments near the Monument boundary.

The Monument area is currently sparsely populated. Nevertheless, population growth is among the factors that would influence the Monument environment in the long term. Population growth in the region is projected to increase by 3 to 4 percent per year over the next 15 years. The potential for development of retirement communities is considered high in the southern part of the region, which could accelerate that growth. This is particularly true near the town of Big Water, where the pending land exchange between the State of Utah and the Department may make 33,208 acres available for private development.

Tourism in the region, specifically visitation to State and National Parks and Monuments, has shown strong growth over the past two decades. That growth is projected to continue, and could add to the level of development in the region beyond that attributable to population growth alone.

The development associated with both population growth and with the growth of tourism are likely to increase visitation to the Monument, to impact air quality, and to increase demands on municipal water supplies. Solid waste and sewage treatment needs would increase. The landscape, which is largely open and undeveloped today, would probably become more roaded, and more developed, as the population and the infrastructure associated with it grows. Noise levels in the Monument could increase as developments, including regional airports, occur.

Growth would bring some adverse impact to air quality, as fugitive dust, automobile emissions, and other emissions associated with communities increase. The nearby Navajo Generating Plant, and regional haze moving in from outside the area, would continue to be the largest factors in air quality for the foreseeable future, however. The continued installation of scrubbers at the Navajo Generating Plant, and the work of the Western Regional Air Partnership, of which Utah is a member, should have beneficial effects on air quality in the region in the future.

Growth could bring adverse effects on water quality. Community water supplies may have to be upgraded to accommodate growth. Waste water treatment facilities may likewise have to be upgraded to protect both groundwater quality and water quality in streams associated with the communities, if those communities outgrow their current systems.

The current water quality problems identified in the Escalante and Paria river systems are not related to the communities, and would not be efficted by community growth. In parts of the Escalante river, cadmium, selenium, phosphorous and silver exceed state standards. In parts of the Paria river system, total dissolved solids, turbidity, phosphorous and lead exceed state standards. It is thought that the source of these problems is the geologic parent material in the river basins, and to naturally high levels of erosion and transportation of this material with runoff.

Much of the land in the region is contained within National Parks, National Forests, a National Recreation Area, and National Monuments. Although this helps to preserve open space, it puts developement pressure on the land available for development, and most of the available land is likely to be developed for housing, infrastructure needs, and commercial uses.

All of these factors, when combined with each of the management alternatives, could be expected to have cumulative impacts on the environment. The probable cumulative impacts are described, by alternative, below.

ALTERNATIVE A (NO ACTION)

In the no action alternative, cross-country vehicle use would continue across much of the Monument. As projected population growth and tourism growth occur, Monument visitation would also increase, since Alternative A has no provision for limiting visitation. The impacts of cross-country vehicle use would increase as visitation increased. The resulting surface disturbance could directly and indirectly impact all Monument resources, biological, geological, paleontological, archeological, and historic. Examples of impacts include the spread of weeds and the increasing risks of theft or damage to paleontological and archeological resources. It could also impact water quality and air quality from both fugitive dust and internal combustion engine waste products.

The increase in visitation would also impact all Monument resources, because of ground disturbance attributable to visitation, and because of the unrestricted access this alternative provides visitors. Access makes it more likely that visitors would damage or collect Monument resources. Unlike the other alternatives, Alternative A does not employ visitor allocations. Further, open access could significantly impact vegetation and other resources, and increase the risks of non-native plant species.

As regional population growth occurs, the associated air quality impacts could damage archeological, historic, biological and paleontological resources of the Monument.

In conclusion, Alternative A, when coupled with the anticipated effects of population growth and growth in tourism, would have a high and ever-increasing level of environmental impact on Monument resources.

ALTERNATIVES B, C, D, E

In Alternatives B, C, D, and E, cross-country vehicle travel is prohibited. This would have large beneficial effects on the environment, although it would reduce the range of activities available for visitors. The surface disturbance associated with cross-country vehicle travel, and the air and water quality problems that result, would not occur in these alternatives. The beneficial effects are similar across Alternatives B, C, D, and E.

In Alternatives B, C, D, and E, vehicles may only travel on routes that are designated open. The alternatives vary in the number of miles of routes that would be designated open. More miles of routes open would result in greater impacts to some resources, because of their accessibility to visitors. More route miles could also impact air and water quality through fugitive dust, and road-related erosion. Alternative E would designate 1,264 miles of routes open. Alternative C would designate 1,187 open, Alternative B would designate 818 miles open, and Alternative D would designate 760. The level of impact is related not only to the number of miles open, but to the level of use the routes would receive and the type of resources subjected to increased risks. Alternatives B, C, D, and E would allow limitations to be placed on visitation, so the levels of use of the routes could be restricted if necessary.

As population and tourism grow, visitation pressure on the Monument would increase. Increased visitation would impact all Monument resources, and would impact, among other things, [illegible] quality, air quality, and the visitor exper[illegible] Those effects could be prevented [illegible] in Alternatives B, C, D, and E by the [illegible]position of the use limits each alternative allows. In addition, inventory and monitoring efforts would be undertaken in the more accessible zones in each alternative, and mitigation and adaptive measures would be implemented consistent with their results. These impacts could to some extent either counteract or reinforce the impacts of other proposed actions on Monument resources.

As regional population growth occurs, the associated air quality impacts could damage archeological, historic, biological and paleontological resources of the Monument. However, air quality is not projected to become a problem in the next 15 years, which is the time frame covered by this plan.

Water quality and water availability could also become problems as a result of growth, if community water supplies and waste-water treatment systems do not keep up with the increasing need. The approach to resolving water-related issues described in Chapter 2, Management Common to All Alternatives, would mitigate or prevent some water-related problems. Water quality monitoring, which is part of Alternatives B, D, and E, would detect water quality degradation, making it possible to work in cooperation with communities, the State of Utah, and adjacent land managers to resolve water quality problems.

Two utility line projects (the upgrade of Pacificorps Cottonwood Canyon power line from 230 kilovolt to 345 kilovolt, and the Lake Powell to Sand Hollow Reservoir water pipeline) have been proposed for future development within the Monument. The timing and exact specifications for both of these projects are uncertain. It is expected that the upgrade of the Cottonwood Canyon powerline could be done with minimal, if any, individual and cumulative impact in all alternatives because the upgrade would only require a permit to increase the voltage running through the powerline. No new structures or installations are expected to be needed for this upgrade.

The specifications and route of the proposed water pipeline between Sand Hollow

Reservoir and Lake Powell are less certain. If the pipeline were built within the existing rights-of-way along Highway 89, and given adequate clearances and mitigation to protect Monument resources, individual and cumulative impacts of the project could be minimal. If the pipeline is proposed to be constructed outside of the Highway 89 rights-of-way and outside of the more intensive zone that encompass that rights-of-way in each alternative, then the impacts to Monument resources could be much greater. Cumulative impacts of the surface disturbance associated with the pipeline combined with other surface disturbing activities (such as livestock grazing and recreational uses) in more remote zones could have greater impacts on visual quality, vegetation, archeology, and other resources. Given the lack of a detailed proposal for this pipeline, it is difficult to ascertain the exact impacts by alternative. In any case, subsequent National Environmental Policy Act analysis would be required at the time a proposal for the pipeline is submitted.

Alternatives B, C, D, and E would have some impacts on adjacent land management. Growing visitation, coupled with the lack of visitor facilities within the Monument, could increase visitation and demand for facilities outside the Monument. While this could be an economic benefit to communities, it could adversely effect adjacent public lands, or necessitate more intensive management of people there. Alternative D, which generally would place the most restrictions on visitor use in the Monument (i.e., the most acreage with group size limits and allocations, the least designated open roads for motorized travel) could have the most significant impacts on adjacent jurisdictions by directing visitation to them.

The restrictions in all alternatives on cross-country vehicle travel could also impact adjacent lands, if cross-country vehicle use there increased as a result. Adjacent National Park Service and United States Forest Service lands would not be affected, since cross-country vehicle use is prohibited there. Adjacent BLM lands could be impacted by increased cross-country vehicle use, reflecting user demands that are redirected from the Monument.

The alternatives vary in their economic impacts to communities surrounding the Monument. Alternative E would bring the largest growth in visitation, with a projected 25 percent increase compared to the No Action Alternative. Alternative B would bring a small increase in visitation, with a projected increase of 6.7 percent compared to Alternative A, while both Alternatives C and D would bring decreases in visitation of 13.6 percent and 40 percent, respectively. Since some of the alternaties project modest increases in visitation compared to baseline projections, adjacent communities may be affected through greater demand for services and infrastructure.

None of the alternatives would have a substantial impact on regional population. Employment would increase the most in Alternative E, followed by Alternative A, then by Alternatives B and C. Alternative D is projected to have a slight decrease in employment. Net revenues to local governments would be greatest in Alternative E, with $330,000 in 2012, followed by Alternative B ($236,000 by 2012), then by Alternative A ($199,000 by 2012). This would be followed by Alternative C ($43,000 by 2012), and Alternative D, with a net revenue deficit of $36,000 by 2012.

All proposed management alternatives are driven by a basic intent to keep most of the landscape in its current condition, with very little new development expected within the Monument. The steady operating budget, constant employee base, and fixed facility locations result in little variation between alternatives and over time. Overall, the impacts of the management alternatives are small. Impacts to local government revenues and expenditures are also relatively small.

Some impacts to the communities, and cumulative impacts to the environment, are directly related to local and regional growth.

None of the alternatives would have a significant effect on regional growth, and the effects of any alternative on local population growth are relatively small.

In conclusion, Alternative A, when considered cumulatively with past, present or reasonably foreseeable future actions, would have a marked impact on the environment, including on Monument resources. Implementation of any of Alternatives B, C, D, and E would have substantially less impact. The degree of actual impact that would occur as a result of each alternative would depend, in part, on application of use limits to control visitor use. Assuming those limits were consistently applied among alternatives, Alternative D would have the least impact, followed very closely by Alternative B. Alternatives C and E would have substantially more impact than either D or B, both on the Monument and on the human environment generally.

Irreversible and Irretrievable Commitment of Resources

The implementation of actions in accordance with the preferred alternative (Alternative B) is not likely to result in significant impacts that may be characterized as irreversible and irretrievable commitments. However, some small-scale disruption to resources may occur, which may in turn prove long term or permanent. These are most likely to be associated with the preferred alternative's concentration of visitation in the Frontcountry zones along several major roads (Highways 12 & 89, and the Burr Trail). Provisions for visitor experience (including day-use) such as trails, overlooks and interpretive sites could yield irremediable impacts on resources such as cryptobiotic soils. Similarly, increased visitor access in the Frontcountry and Passage Zones could increase the risk of spreading non-native plants and disrupt the habitat of certain species. Impacts would be monitored to determine the extent to which they may prove irreversible and irremediable, and adaptive management would be employed as appropriate. Further, it is important to note that the risk of such impacts under the preferred alternative is notably less than current management (Alternative A).

Issues Considered but not Analyzed by Alternative

There are several factors that must be considered in all Environmental Impact Statements because of laws, regulations, and executive orders, but which are not necessarily analyzed by alternative. They are discussed below.

IMPACTS ON AREAS OF CRITICAL ENVIRONMENTAL CONCERN

There are no existing Areas of Critical Environmental Concern in the Monument. Therefore, there would be no impact on the relevance and importance criteria for any areas of critical environmental concern.

IMPACTS ON PRIME AND UNIQUE FARMLANDS

There are no prime or unique farmlands, or farmland of statewide or local importance on public lands in the Monument. None of the actions anticipated with the alternatives analyzed in detail would disturb farmlands. Therefore, impacts on prime and unique farmlands are not analyzed further in this EIS.

IMPACTS ON FLOODPLAINS

There are no floodplains associated with large rivers in the Monument. No projects or activities that would result in permanent fills or diversions in, or placement of permanent facilities on active floodplains of major rivers are projected to occur with implementation of any of the alternatives analyzed in detail. Therefore, impacts on floodplains are not analyzed in detail.

IMPACTS ON GEOLOGICAL RESOURCES

Specific impacts on geological resources are not identified. This is because impacts on geology are difficult to separate from impacts to other resources which the geology of the Monument supports. Thus, impacts on geology are discussed elsewhere, either implicitly or explicitly, in the discussions of impacts to other resources such as paleontology and scenic quality.

IMPACTS ON OR FROM HAZARDOUS AND SOLID WASTES

No hazardous, toxic, or unapproved solid waste sites are known to occur on public lands in the Monument. None of the actions, activities, and uses projected to occur with implementation of the plan alternatives would require the handling, storage, or release of large quantities of these wastes. Therefore, impacts on or from hazardous and solid wastes is not analyzed in detail.

IMPACTS ON NATIVE AMERICAN TRUST RIGHTS

Impacts on Native American Trust Rights are not analyzed in detail in this Environmental Impact Statement because no trust rights are associated with lands inside the Monument. As described in Chapter 2, under Management Common to All Alternatives, the BLM would consult with tribes in order to minimize impacts on ancestral sites and traditionally associated resources.

IMPACTS ON ENVIRONMENTAL JUSTICE

The local communities in and around the Monument are typically below the State average per capita annual income of approximately $17,000 and are almost exclusively Caucasian. For example, the percentage of Caucasian people in Garfield county is about 98 percent. The implementation of any of the plan alternatives would have a greater effect on the well-being of the local low income populations than on the more affluent populations in other areas of the State and country. However, because the affected local communities are homogenous and would be uniformly affected, there would not be an unequal distribution of risks and benefits in those communities from implementation of a Monument Management Plan.

Native American Indian populations would not be disproportionately affected by any of the plan alternatives. Exceptions to restrictions on uses of plants, collection of natural resources and access to certain locations would be granted for Native American Traditional practices.

IMPACTS OF VALID EXISTING RIGHTS AND STATE AND PRIVATE LANDS ON MONUMENT RESOURCES AND MANAGEMENT

The effects of valid existing rights on public lands and potential uses of in-held state and private lands are not analyzed in detail in this EIS for reasons similar to those explained in Chapter 2 for the Full Field Mineral Development. Valid existing rights are described in Chapter 2, under Management Common To All Alternatives. Refer to the Cumulative Impacts section in Chapter 4 for more discussion of impacts of current operations.

If the Utah land exchange covered by the May 8, 1998, Agreement between the United States and the State of Utah should become law, it would simply consolidate administration of all state and Federal mineral leases and should have little practical effect on the lessees, because the leased state lands are surrounded by leased Federal lands held by the same companies. Moreover, while Federal laws and regulations may be applicable to Federal actions on the newly acquired Federal land, the application of these laws and regulations must respect the valid existing rights of the lessees. From a practical standpoint, such laws and regulations would probably apply in some fashion already to activities on those state inholdings. For example, most mineral activity on state land within the Monument requires access across Federal land or activity on Federal leases to which Federal laws and regulations triggered by Federal action apply. For that reason, a change in land ownership would not significantly alter applicable regulatory authority or have impacts beyond those analyzed in this plan, and is therefore not analyzed by alternative.

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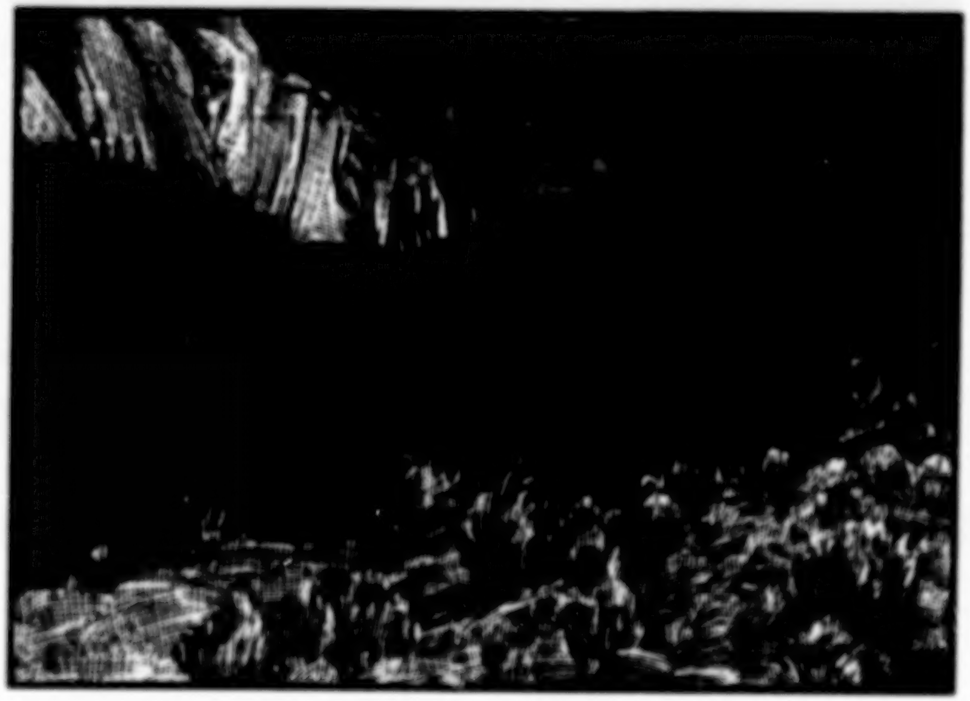

TABLE 4.1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on paleontological resources	Paleontological resources could be affected in this alternative more so than in Alternatives B, C, D, or E, as it affords the least amount of visitor management options. Most of the degrading impacts would result from few restrictions on motorized and mechanized cross-country travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,571,162 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,684,899 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,684,899 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Paleontological resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,264) miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Impacts to paleontological resources would be mitigated prior to any ground disturbing activity. Impacts to paleontological resources would be mitigated through visitor number limitations on 1,466,541 acres. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

CHAPTER 4 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on archaeological and historic resources	Archaeological and historic resources could be impacted in this alternative more so than in the other alternatives, as it affords the fewest visitor management options. Most of the degrading impacts would result from motorized and mechanized cross-country travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated during any ground disturbing activity. No limits on group sizes could also result in degradation of cultural and historic resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated during any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 1,541,025 acres) and visitor number limitations (on 1,571,162 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated prior to any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 972,364 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated prior to any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 1,571,083 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Archaeological and historic resources would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Impacts would be mitigated prior to any ground disturbing activity. Impacts to archaeological and historic resources from visitation increases would be partially mitigated through group size (on 1,466,541 acres) and visitor number limitations (on 1,466,541 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impact from research uses and water developments would be mitigated

CHAPTER 4 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on vegetation	Vegetation could be impacted by this alternative to a much greater degree because it lacks restrictions on cross-country vehicle use. Up to 8 acres could be disturbed by reasonably foreseeable actions. The potential for impacts to vegetation from increases in visitation would be likely because of no use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 34 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from increases in visitation would be partially mitigated through group size (on 1,541,025 acres) and visitor number limitations (on 1,571,162 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from increases in visitation would be partially mitigated through group size (on 972,364 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 36 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from visitation increases would be partially mitigated through group size (on 1,571,085 acres) and visitor number limitations (on 1,684,899 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Vegetation would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Limiting the network of maintained routes and restrictions on equipment to suppress wildfires would prevent impacts to vegetation from surfacing activities. Because of these limitations more vegetation could be burned. Up to 43 acres could be disturbed by reasonably foreseeable actions. Impacts to vegetation from visitation increases would be partially mitigated through group size (on 1,466,541 acres) and visitor number limitations (on 1,466,541 acres). The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on threatened and endangered plant species	Impacts to 1,691 acres of known Jones' Cycladenia populations and habitat and 2,851 acres of Kodachrome bladderpod populations and habitat could occur from off-highway vehicle travel. Ute ladies'-tresses populations and habitat (64 acres) were closed to off-highway vehicle travel. There would be no significant impacts to Kodachrome bladderpod and Jones' Cycladenia from increased visitor use. Impacts to Ute ladies'-tresses populations and habitat could occur from unregulated visitor use. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.	Closing the Monument to cross-country motorized and mechanized use would afford substantial protection to threatened and endangered plant populations and their habitats. Surveys for threatened or endangered plants would be conducted before any ground disturbing activities could occur. Group size restrictions and allocations could reduce impacts from day-use activities on Ute ladies'-tresses. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses would be mitigated.

CHAPTER 4 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on relict vegetation	Most relict vegetation would not be protected from cross-country vehicle travel, although it is unlikely that these areas would be receive any use. Unrestricted use by visitors has the potential to impact these communities. No visitor facilities would be constructed in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.	Relict vegetation would be protected by closing the Monument to cross-country motorized and mechanized use, limiting group size and numbers of people, and by not allowing any facility developments in these areas. Adverse impacts from research uses would be mitigated.
Impacts on riparian resources	Impacts could occur in riparian areas from the lack of restrictions on visitor use. Riparian resources could be impacted by cross-country vehicle travel. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. The lack of group size limits and other visitor allocations could continue to adversely impact some riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Riparian resources would be protected by closing the Monument to cross-country motorized and mechanized use. None of the reasonably foreseeable actions for visitor site facility construction would be allowed in riparian areas. Group size limits and other allocations would help reduce impacts from people on riparian resources. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts of weeds	This alternative would have the greatest potential for the spread of weeds. In part because much of the Monument would remain open to cross-country vehicle travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation could occur because no limitations would be applied. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Weed dispersal would be minimized by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Appropriate mitigation would prevent the spread of weeds in areas with surface disturbance. Impacts that could lead to the spread of weeds due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on cryptobiotic soils	Impacts to cryptobiotic soils would come from unregulated cross-country vehicle travel. Up to 8 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils could come from unregulated visitor use. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Cryptobiotic soils would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Every effort would be made to prevent any disturbance to cryptobiotic soils during any ground disturbing activity. Impacts to cryptobiotic soils due to increased visitation would be partially mitigated through limitations on group size and visitor use allocations. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on wildlife	Impacts to wildlife would occur from increased interactions with humans and potential habitat degradation from continued cross-country vehicle use. Up to 8 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Increased visitation with no group limits or allocations could impact wildlife. Animal damage control activities would directly impact targeted wildlife species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control efforts would impact targeted wildlife populations only after other means of control have been exhausted. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control efforts would impact targeted wildlife populations only after other means of control have been exhausted. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control activities would not be allowed reducing impacts on wildlife populations that would otherwise be targeted. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Wildlife would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. If present on the specific site, there would be a short term impact to wildlife during site construction. Every effort would be made to minimized any short term impacts to wildlife during any ground disturbing activity. Group size limits and other allocations would help reduce impacts from people on wildlife. Animal damage control efforts would impact targeted wildlife populations except where they conflict with management objectives for visitor use or fish and wildlife. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on threatened and endangered animal species	There are currently no known conflicts with threatened or endangered animal species. Lack of cross-country vehicle travel restrictions could allow the potential for impacts to threatened and endangered animal species. Up to 8 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to construction. If species were present, no construction would be allowed. If increased visitation were found to have impacts on threatened or endangered species, measures would be taken to protect the species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Threatened and endangered animal species would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. It is not anticipated that this disturbance would occur in areas where threatened or endangered animal species occur. Clearances would be conducted prior to constructin.If species were present, no construction would be allowed. Group size limits and other allocations would help reduce interactions between people and threatened and endangered animal species. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on the Paunsaugunt deer herd	Much of the Paunsaugunt deer herd habitat would remain open to cross-country vehicle travel, increasing access into the area. This could result in deer being subjected to human interference and physiological stress during their most biologically sensitive periods. Construction of visitor facilities would be minimal. Use in the herd area is expected to remain low.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.	Cross-country vehicle travel would be prohibited in the herd area. The area would be accessible for certain types of vehicles on designated routes. The construction of visitor facilities could cause some short-term stress related effects during construction and could destroy a small amount of habitat.

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on surface water quality	Lack of cross-country vehicle travel restrictions would allow potential impacts to surface water quality to continue. Up to 8 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in a manner that sediment or other contaminants would not be introduced into water sources. Increases in unregulated visitation would add to surface water quality impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.	Surface water quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. It is anticipated that impacts from this disturbance would be minimal. Facilities would be constructed in such a manner that sediment or other contaminants would not be introduced into water sources. Group size limits and other allocations would help reduce impacts. The effects of grazing would be assessed and, if impacts were found, adaptive management measures could be implemented. Adverse impacts from research uses and water developments would be mitigated.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on air quality	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	BLM would pursue a PSD Class I air quality redesignation for the Monument. This would provide long-term air quality protection for the Monument, although the presence of Class I areas surrounding the Monument could have the same effect. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.	Continue PSD Class II air quality designation. The presence of Class I areas surrounding the Monument could effectively limit air quality deterioration. The anticipated levels of construction and vehicle use on unpaved routes would result in localized increases in fugitive dust that would be temporary and would not exceed air quality standards.
Impacts on wild and scenic river values	A determination for suitability on the 25 eligible river segments (330 miles) would not be made. The segments would not be recommended to congress for designation into the NWSRS and would not receive the degree of protection that designation would provide. Protective management would continue indefinitely.	17 (252 miles) of the 25 eligible river segments would be determined suitable for recommendation to Congress for designation into the NWSRS. There would be no adverse impacts from planned actions anticipated for any segments determined suitable. The suitable segments would be managed for the preservation of the outstandingly remarkable values, under the direction of the plan. The 8 segments determined unsuitable would be managed under the direction and prescriptions of the plan.	All 25 of the eligible river segments (330 miles) would be determined unsuitable. The segments would not be recommended to congress for designation into the NWSRS and would not receive the degree of protection that designation would provide. The 25 segments determined unsuitable would be managed under the direction and prescriptions of the plan.	All 25 eligible river segments (330 miles) would be determined suitable for recommendation to Congress for designation into the NWSRS. There would be no adverse impacts from planned actions anticipated for any segments determined suitable. The suitable segments would be managed for the preservation of the outstandingly remarkable values, under the direction of the plan.	17 (252 miles) of the 25 eligible river segments would be determined suitable for recommendation to Congress for designation into the NWSRS. There would be no adverse impacts from planned actions anticipated for any segments determined suitable. The suitable segments would be managed for the preservation of the outstandingly remarkable values, under the direction of the plan. The 8 segments determined unsuitable would be managed under the direction and prescriptions of the plan.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on research activities	Provides the greatest access for research and the least protection for the research value of Monument resources. Animal damage control activities would impact some research related to wildlife populations and natural systems.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 1,047 mile network of designated public and administrative routes would be open to motorized and mechanized use. Animal damage control activities would impact some research related to wildlife populations and natural systems when other measures have been exhausted.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 1,367 mile network of designated public and administrative routes would be open to motorized and mechanized use. Animal damage control activities would impact some research related to wildlife populations and natural systems when other measures have been exhausted.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 790 mile network of designated public and administrative routes would be open to motorized and mechanized. Animal damage control activities would not be permitted.	Research value of Monument resources would be protected by closing the Monument to cross-country motorized and mechanized use. A 1,348 mile network of designated public and administrative routes would be open to motorized and mechanized use. Animal damage control activities would impact some research related to wildlife populations and natural systems except when such activities affect management objectives for visitor use or wildlife and fish.
Impacts on livestock operations	Cross-country motorized travel and access on existing routes would facilitate livestock management operations. Greater access to the general public could increase the chance of damage to range improvement or harassment of livestock. Construction of new water developments to protect Monument resources could also have a beneficial impact on livestock operations. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 1,347 miles. Construction of new water developments to protect Monument resources could also facilitate achieving resource condition objectives for grazing. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 1,367 miles. Construction of new water developments to protect Monument resources could also facilitate achieving resource condition objectives for grazing. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 790 miles. Construction of new water developments would not be permitted, limiting the range of options available to livestock operators to achieve resource condition objectives. Animal damage control activities would not be permitted which could impact livestock operations by increasing predation losses.	Access would be reduced in this alternative as compared to the no action. Administrative and public access on designated routes would be 1,348 miles. Construction of new water developments for purpose of protecting Monument resources or to enhance management of livestock, wildlife, recreation or watershed resources could also facilitate achieving resource condition objectives. Animal damage control activities could have a beneficial impact on livestock operations by removing animals known to have killed livestock.

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ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on forestry product use	Cross-country vehicle access would not be restricted in fuelwood collection areas, facilitating the collection of these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.	No cross-country vehicle access would be allowed, making it more difficult to easily access and collect these products.
Impacts on recreational use	This alternative would result in the greatest number of unrestricted uses, with the fewest developments to support these uses. Much of the Monument would remain open to cross-country vehicle travel. More routes would be open to travel in this alternative. Visitors would be accommodated in with the construction of 16 new visitor facilities. Crowding would likely occur in developed areas and on trails. Lack of group size limits would impact visitor experience due to the noise and visual impacts of large groups. Animal damage control activities would directly and indirectly impact visitor experiences.	Visitors would be provided with opportunities for both developed and *primitive* experiences with this alternative. Visitors would be able to experience the Monument on the 818 miles of designated routes would be open to motorized and mechanized use. ATV and dirt bike users would be accommodated on the 591 miles of the 818 miles that would be designated open for non-street legal ATV and dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitors would be accommodated in this alternative with the construction of 32 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.	Visitors would be able to experience the Monument on the 1,187 miles of designated routes would be open to motorized and mechanized use. No routes would be designated for non-street legal ATV or dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitor experiences would be facilitated by the addition of 20 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.	This alternative is the most restrictive, but would provide visitors with the greatest opportunities for primitive experiences. Visitors would be able to experience the Monument on the 760 miles of designated routes would be open to motorized and mechanized use. No routes would be designated for non-street legal ATV or dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitor experiences would be facilitated by the addition of 20 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.	The widest range of visitor experiences would be afforded with this alternative. Visitors would be able to experience the Monument on the 1,264 miles of designated routes would be open to motorized and mechanized use. ATV and dirt bike users would be accommodated on the 980 miles of the 1,264 miles that would be designated open for non-street legal ATV and dirt bike use. The Monument would be closed to cross-country motorized and mechanized use. Visitors would be most accommodated in this alternative with the construction of 43 new visitor facilities. Group size limits and other allocations would help reduce potential overcrowding impacts from people. Animal damage control activities would directly and indirectly impact visitor experiences.

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CHAPTER 4 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on outfitters and guides	Existing outfitters and guide permits would likely benefit the most from this alternative. Although they would not be able to expand their operations.	Outfitters and guides would benefit because they would be allowed to operate throughout the Monument. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.	Outfitters and guides would be allowed to operate throughout most of the Monument. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.	Outfitters and guides would be allowed to operate throughout the Monument. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.	Outfitters and guides would benefit because they would be allowed to operate throughout the Monument. This alternative provides the fewest restrictions. These users would be subject to the same restrictions and limitations as other users. The limitations include group size, allocations, and travel restrictions on designated routes.
Impacts on scenic quality	Continued cross-country vehicle use could create noticeable intrusions detracting from the scenic quality. Surface disturbance from construction of visitor facilities would be 8 acres. The visual resource contrast rating system would be used to decrease impacts. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). Up to 34 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). Up to 36 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.	Scenic quality would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). Up to 43 acres could be disturbed by reasonably foreseeable actions. Visitor facilities would be designed to mitigate impacts to visual resources and conform to the assigned visual resource management class objective. Adverse impacts from research uses and water developments would be mitigated.

CHAPTER 4 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on primitive unconfined values	Lack of cross-country vehicle restrictions and unlimited access in this alternative would affect primitive unconfined values. Large portions of the Monument would not be protected from the sights and sounds of motorized and mechanized recreation. The construction of visitor site facilities could concentrate visitor use at the developed sites and reduce impacts on primitive and unconfined values in the rest of the Monument. Not limiting group size could increase impacts on naturalness if groups concentrate on trails and in campsites. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (818 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (1,187 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (760 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.	Primitive and unconfined values would be protected by closing the Monument to cross-country motorized and mechanized use (1,264 miles of designated routes would be open to motorized and mechanized use). The construction of visitor site facilities would focus visitor use in those areas, reducing impacts on primitive and unconfined values in the rest of the Monument. Group size limits and other allocations would help reduce impacts from people. Adverse impacts from research uses and water developments would be mitigated.

CHAPTER 4 - SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ISSUE	ALTERNATIVE A (NO ACTION)	ALTERNATIVE B (PREFERRED)	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Impacts on local economies	The annual growth rate in visitation would be 4.7 percent in this alternative, with 217,190 visitor days in 1998, growing to 414,764 visitor days in 2012. Regional population growth attributable to this alternative would be 370 people in 2012. By 2012, the additional employment generated by this alternative would be 219 jobs, with employee earnings reaching $6,001,000 in that year. Local government revenues attributable to this alternative would be $516,000 in 2012, with expenditures of $317,000, for a net revenue of $199,000 to local governments.	The annual growth in visitation in this alternative would be 5.2 percent, with 442,633 visitor days in 2012, 6.7 percent higher than Alternative A. Regional population growth attributable to this alternative would be 422 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 248 jobs, compared to 219 in Alternative A. Employee earnings would reach $6,[illegible],000 in 2012, 10.6 percent higher than Alternative A. Local government revenues attributable to this alternative would be $ 598,000 in 2012, with expenditures of $362,000, for a net revenue of $236,000 to local governments, 18.6 percent higher than in Alternative A.	The annual growth in visitation in this alternative would be 3.7 percent, with 358,274 visitor days in 2012, 13.6 percent lower than Alternative A. Regional population growth attributable to this alternative would be 282 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 163 jobs, compared to 219 in Alternative A. Employee earnings would reach $3,828,000 in 2012, 36 percent less than Alternative A. Local government revenues attributable to this alternative would be $288,000 in 2012, with expenditures of $245,000, for a net revenue of $236,000 to local governments, 78 percent lower than in Alternative A.	The annual growth in visitation in this alternative would be 1.2 percent, with 248,055 visitor days in 2012, 40 percent lower than Alternative A. Regional population growth attributable to this alternative would be 6 people in 2012, compared to 370 people in Alternative A. By 2012, this alternative would show a net loss of 1 job, compared to an increase of 219 jobs in Alternative A. Employee earnings would reach $1,480,000 in 2012, 75 percent less than Alternative A. Local government revenues attributable to this alternative in 2012 would be less than expenditures, for a net revenue deficit of $36,000.	The annual growth in visitation in this alternative would be 6.3 percent, with 519,208 visitor days in 2012, 25 percent higher than Alternative A. Regional population growth attributable to this alternative would be 544 people in 2012, compared to 370 people in Alternative A. By 2012, the additional employment generated by this alternative would be 324 jobs, compared to 219 in Alternative A. Employee earnings would reach $7,963,000 in 2012, 32.7 percent higher than Alternative A. Local government revenues attributable to this alternative would be $792,000 in 2012, with expenditures of $462,000, for a net revenue of $330,000 to local governments, 65.8 percent higher than in Alternative A.
Cumulative Impacts	When coupled with the anticipated effects of population growth and growth in tourism, a high and ever-increasing level of environmental impact on Monument resources would occur.	Implementation of any of Alternatives B, C, D, or E would have substantially less impact than Alternative A. The degree of actual impact that would occur as a result of each alternative would depend, in part, on application of use limits to control visitor use. Assuming those limits were consistently applied among alternatives, Alternative D would have the least impact, followed by Alternative B. Alternatives C and E would have substantially more impact than either D or B, both on the Monument and on the human environment.			

Chapter 5

Consultation and Coordination

CHAPTER 5 - CONSULTATION AND COORDINATION

PUBLIC PARTICIPATION

There have been and will continue to be many ways for the public to participate in the planning process for Grand Staircase-Escalante National Monument. From May 1997 through October 1998 nine Planning Update Letters were sent to those on the mailing list and made available to those visiting the Monument. The update letters contained information on how to become involved in the planning process, identified preliminary planning criteria, announced the call for Areas of Critical Environmental Concern and Wild and Scenic River nominations, summarized comments from scoping, identified planning issues, and outlined management scenarios.

The following *Federal Register* Notices were published announcing important aspects of the plan preparation:

- *Federal Register* (Vol. 62, No. 130, pages 36570-36571) July 8, 1997 — Notice of Intent to Prepare a Management Plan and Environmental Impact Statement
- *Federal Register* (Vol 62, Nol 141, page 39534) July 23, 1997 — Notice of Intent to Prepare a Management Plan and Environmental Impact Statement: Correction [phone number]
- *Federal Register* (Vol. 62, No. 147, page 41074) July 31, 1997 — Notice of Public Involvement and Scoping Opportunities for the Grand Staircase-Escalante National Monument Management Plan and Associated Environmental Impact Statement
- *Federal Register* (Vol. 63, No. 31, pages 7820-7822) February 17, 1998 — Call for Information on the Grand Staircase-Escalante National Monument Management Plan Regarding Areas of Critical Environmental Concern (ACEC) and Wild & Scenic Rivers (W&SR)

SUMMARY OF SCOPING

Fifteen scoping workshops were held between August and October 1997, in Utah, Colorado, New Mexico, Arizona, Nevada, California, and Washington, D.C. The dates and locations of the workshops were announced in the July 31, 1997 Federal Register (V. 62, No. 147, p. 41074) and in local media sources for the city or town where the meetings were held.

Each workshop began with an introductory overview of the Monument and the planning process, then participants broke into smaller facilitated groups. In these smaller groups, members were encouraged to identify what they valued about the Monument, what they envisioned as the purposes of management, and how they saw the role of local communities. Over 1,100 people attended the workshops.

- Big Water, Utah, 8/12/97, 33 attended
- Escalante, Utah, 8/14/97, 83 attended
- Orderville, Utah, 8/19/97, 21 attended
- Kanab, Utah, 8/21/97, 68 attended
- Cedar City, Utah, 8/26/97, 58 attended
- Tropic, Utah, 8/27/97, 61 attended
- Panguitch, Utah, 8/28/97, 23 attended
- Salt Lake City, Utah, 9/2/97, 172 attended
- Las Vegas, Nevada, 9/4/97, 52 attended
- Flagstaff, Arizona, 9/16/97, 104 attended
- Lakewood, Colorado, 9/30/97, 8[illegible] attended
- Santa Fe, New Mexico, 10/2/97, 105 attended
- San Francisco, California, 10/9/97, 89 attended
- Moab, Utah, 10/14/97, 66 attended
- Washington, D.C., 10/16/97, 85 attended

In addition to the scoping meetings, Visions Kits were sent to over 2,000 individuals on the Monument mailing list. These scoping kits , which elicited public input on the values, purposes, and management of the Monument, were also distributed at information centers and at meetings attended by Planning Team members.

An online Visions Kit was also available on the Monument's home page for those with access to the Internet. The online Kit provided the same background information that was provided at each scoping meeting, and furnished a place for comments. Approximately 35 percent of the comments received were from the Internet.

More than 2,500 comments were received at the Planning Office by October 31, 1997. Beginning in November, the Planning Team began analysis of the comments for incorporation into the Draft Plan.

PLANNING CONSISTENCY

The Federal Land Policy and Management Act (FLPMA), Title II, Section 202, provides guidance for the land use planning system of the Bureau of Land Management (BLM) to coordinate planning efforts with Native American Indian tribes, other Federal departments, and agencies of the state and local governments. In order to accomplish this directive, the Bureau of Land Management is directed to keep apprised of state, local, and tribal plans; assure that consideration is given to such plans; and to assist in resolving inconsistencies between such plans and Federal planning. The section goes on to state in Subsection c) (9) that *"Land use plans of the Secretary under this section shall be consistent with State and local plans to the maximum extent he finds consistent with Federal law and the purposes of this Act."* The provisions of this section of FLPMA are echoed in Section 1610.3 of the BLM Resource Management Planning regulations.

In keeping with the provisions of this section, the Planning Team established regular opportunities for interaction with state, local and tribal officials. State, county, and municipal officials have participated in regular information meetings. As mentioned elsewhere, the team included five professionals nominated by the Governor of Utah. Further coordination with the counties and State included: providing Federal money to assist in planning and other Monument related issues, cooperating with the State of Utah Governor's Office of Planning and Budget on developing the economic analysis for the plan, and cooperating with the State of Utah to integrate and share GIS data. Planning Team members also attended many tribal government meetings, in order to consult with tribal officials regarding the Monument planning process.

Consultation with the Fish and Wildlife Service (FWS) under Section 7 of the Endangered Species Act was begun by letter in April 1998. A list of threatened and endangered plant and animal species was requested. A copy of the letter from the FWS can be found in Appendix 13.

Ten municipal plans, 2 county plans, 2 regional plans, 16 Utah State agency plans, and 8 Federal agency plans were reviewed. No major inconsistencies were identified. In some cases, specific provisions of the alternatives described in this Draft Monument Management Plan and Draft Environmental Impact Statement have been formulated to coordinate with other agency plans. For example, the group size recommendations in each alternative correspond to adjacent Federal agency group size limits.

According to Section 1610.4-7 of the Bureau of Land Management Resource Management Planning Regulations, the Draft Monument Management Plan and Draft Environmental Impact Statement is provided to the Governor, other Federal agencies, state and local governments, and Native American Indian tribes for comment. The resulting comments will be addressed in the Proposed Management Plan. The formal 60-day consistency review by the Governor will occur after the Proposed Management Plan is published in 1999, as outlined in 1610.3-2(e) of the BLM Planning Regulations.

The following plans were evaluated for consistency:

- Boulder, Utah General Plan (6 April 1994)
- Cannonville, Utah General Plan (20 November 1997)
- Escalante, Utah General Plan (21 March 1995)

- Henrieville, Utah General Plan (12 November 1997)
- Tropic, Utah General Plan (14 February 1996)
- Alton Town General Plan (April 1981)
- Big Water, Utah General Plan (16 January 1996, as amended)
- Glendale, Utah General Plan (preliminary draft, not adopted)
- Kanab, Utah General Plan (26 September 1995)
- Orderville, Utah General Plan (April 1981)

- Garfield County, Utah General Plan (13 March 1995, as amended)
- Kane County, Utah General Plan (22 June 1998)

- Kane County Water Conservancy District Plan (July 1997)
- Washington County Water Conservancy (March 1995)
- District Lake Powell Pipeline Study (March 1995)

- Five County Association of Governments Consolidated Plan (January 1998)
- Western Regional Corridor Study (1992)
- Garkane Power Association 1997-2000 Construction Work Plan (April 1997)

- Utah State Water Plan-West Colorado River Basin Committee Review Draft (May 1998)
- Utah State Deer and Elk Management Plans (23 April 1998)
    - Deer Herd-Sub-Unit#25-c (Plateau)
    - Deer Herd Unit #26 (Kaiparowits)
    - Deer Herd Unit #27 (Paunsaugunt)
    - Elk Herd-Sub-Unit #25-c (Boulder)
    - Elk Herd Unit #26 (Kaiparowits)
    - Elk Herd Unit #27 (Paunsaugunt)
- Utah State Transportation Improvement Plan 1998-2002, Legislative Edition (1998)
- Utah State Draft Wildlife Strategic Plan, Internal/External Assessment Summary (6 February 1998)
- Utah State Statewide Improvement Program (Air Quality) (18 December 1992)
- Utah Tomorrow Strategic Plan 1998 Annual Report (April 1998)
- Utah State Air Quality Implementation Plan (18 December 1992)
- Utah State 1992 Comprehensive Outdoor Recreation Plan (June 1993)
- Utah Statewide Transportation Improvement Program 1998-2002 (1998)
- Frontiers 2000: A System Plan to Guide Utah State Parks and Recreation into the 21st Century (September 1996)
    - Coral Pink Sands Dunes State Park Management Plan
    - Kodachrome Basin State Park Management Plan
    - Petrified Forest State Park Management Plan
    - Anasazi Village State Park Management Plan
- Aquatic Management Plan, Escalante River Drainage Hydrologic Unit (January 1998)

- Ute Ladies'-tresses (*Spiranthes diluvialis*) Draft Recovery Plan
- Kodachrome Bladderpod (*Lesquerella tumulosa*) Draft Recovery Plan
- Recovery Plan for Bald Eagle (*Haliaeetus leucocephalus*) (July 1983)
- Recovery Plan for American Peregrine Falcon (*Falco peregrinus anatum*) (December 1984)
- Recovery Plan for Mexican Spotted Owl (*Strix occidentalis lucida*) (December 1995)

- Cedar Beaver Garfield Antimony Resource Management Plan (October 1984)
- Arizona Strip Resource Management Plan and Final Environmental Impact Statement (December 1990)
- Dixie National Forest Land & Resource Management Plan (September 1986; amended 1995)
- Kaibab National Forest Land & Resource Management Plan (April 1988; amended 1989, 1990, 1996)
- North Kaibab Ranger District Recreation Strategy (March 1997)
- Glen Canyon National Recreation Area Proposed General Management Plan, Wilderness Recommendation, Road Study Alternatives-Final Environmental Statement (July 1979)

- Glen Canyon National Recreation Area Fish Management Plan (April 1996)
- Glen Canyon National Recreation Area Final Commercial Services Plan (22 October 1997)
- Glen Canyon National Recreation Area Final Wahweap Development Concept Plan (15 June 1998)
- Zion National Park Proposed General Management Plan (12 August 1975)
- Zion National Park Zion Canyon Development Concept Plan (December 1980)
- Natural Resource Management Plan and Environmental Assessment for Zion National Park (13 December 1983)
- Draft Visitor Management Resource Protection Plan for Zion National Park (anticipated release February 1999)
- Bryce Canyon National Park General Management Plan and Development Concept Plan (1987)
- Bryce Canyon National Park Statement for Management (1993)
- Capitol Reef National Park Draft General Management Plan and Development Concept Plan (March 1998)

EIS DISTRIBUTION LIST

FEDERAL AGENCIES

U.S. Government Printing Office
Library of Congress
Advisory Council on Historic Places
Agricultural Stabilization and Conservation Service
Forest Service
- Dixie National Forest
- Regional Office, Region 4

Natural Resource Conservation Service
Color Country Resource Conservation and Development Council
Department of the Interior
- Office of Environmental Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Fish and Wildlife Service
- Minerals Management Service
- National Park Service
- U.S. Geological Survey

Army Corps of Engineers
Department of Energy
- National Petroleum Council

Department of Transportation
- Federal Aviation Administration
- Federal Highway Administration

U.S. Environmental Protection Agency
Office of the Solicitor
Water and Power Resources Service

STATE GOVERNMENT AGENCIES

Arizona State Historic Preservation Officer
Brigham Young University
Dixie College
Southern Utah University
University of Utah
Utah Department of Agriculture
Utah Department of Community and Economic Development
Utah Department of Environmental Quality
Utah Department of Natural Resources
Utah Division of Parks and Recreation
Utah Division of Air Quality
Utah Division of Forestry and Fire Control
Utah Division of Water Rights
Utah Division of Water Resources
Utah Division of Water Quality
Utah Division of Wildlife Resources
Utah Geological Survey
Utah Governor's Office of Planning and Budget
Utah State Clearing House
Utah State Historic Preservation Office
Utah State Institutional and Trust Lands Administration
Utah State University Extension Service
Utah State University
Utah Travel Council

TRIBAL GOVERNMENTS AND GROUPS

Hopi Tribe
Navajo Nation
- Historic Preservation Office
- Bodaway & Gap Chapters Navajo Nation
- Cameron Chapter Navajo Nation
- Kaibeto Chapter Navajo Nation
- Lechee Chapter Navajo Nation
- Oljato Chapter Navajo Nation

Paiute Tribes of Utah
Kaibab Paiute
San Juan Paiute
Zuni Tribe
Zuni Tribe Cultural Preservation Office

LOCAL GOVERNMENTS AND COMMISSIONS

Alton Town Council
Antimony Town Council
Big Water Town Council
Boulder Town Council
Cannonville Town Council
Escalante Town Council
Glendale Town Council
Hatch Town Council
Henrieville Town Council
Kanab City Council
Orderville Town Council
Panguitch City Council
Tropic Town Council

Beaver County Commission

Coconino County Commission
Five-County Association of Governments
Garfield County Commission
Grand County Commission
Iron County Commission
Kane County Commission
Mojave County Commission
Wayne County Commission
Washington County Commission

Washington County Water Conservation District
Wide Hollow Water Conservancy District

NON-GOVERNMENT ORGANIZATIONS

The Access Fund
American Associations for the Advancement of Science
American Canoe Association
American Hiking Society
American Lands Access Association, Inc.
American Mining Association
American Motorcyclist Association
American Outdoors
American Petroleum Institute
American Recreation Coalition
American Rivers
American Whitewater Affiliation
Audubon Society
Backcountry Horsemen of Utah
Black Diamond Equipment, Ltd.
California Association of 4WD Clubs, Inc.
Council on Utah Resources
Dixie Geological Society
Ecological Society of America
Environmental Defense Fund
The Environmental Law Institute
Escalante Cattlemen's Association
Forever Resorts
Grand Canyon Trust
Garkane Power Association
Helicopter Association International
The International Association of Fish and Wildlife Agencies
International Mountain Biking Association
Izaak Walton League
Kampgrounds of America
Kanab Cattlemen's Association
Kanab/Escalante Livestock Permittees
Mineralogical Society of America
Mountain Recreation
National Association of RV Parks and Campgrounds
National Association of Counties
National Council of Public Land Users
National Farm Bureau
National Geographic Society
National Mining Association
National Outdoor Leadership School
National Parks and Conservation Association
National Parks and Recreation Association
National Stock Grower's Association
National Trust for Historic Preservation
National Wildlife Federation

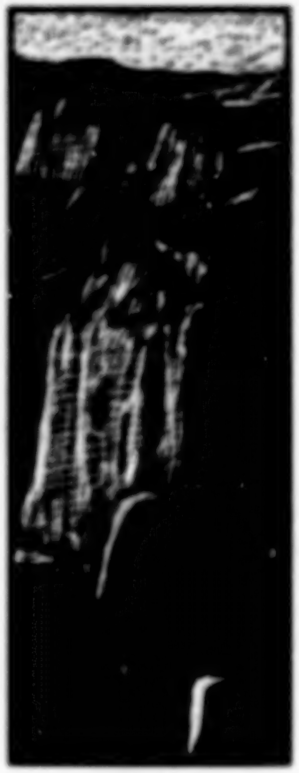
Natural Resources Defense Council
Natural Areas Association
Nature Conservancy
Outdoor Recreation Coalition of America
Outward Bound
Paleontological Society
Professional Paddlesports Association
Public Lands Council
Public Lands Foundation
Raptor Research Foundation
Recreation Vehicle Industry Association
Rocky Mountain Elk Foundation
Save Our Canyons Committee
Sierra Club
The Soaring Society of America, Inc.
Scenic America
Society for American Archaeology
Society for Range Management
Society of Vertebrate Paleontology
Southern Utah Wilderness Alliance
Sporting Goods Manufacturers Association
Trout Unlimited
Trout Unlimited, Utah Chapter
The Trust for Public Lands
Utah Archaeological Society
Utah Audubon Society
Utah Cattlemen's Association
Utah Farm Bureau
Utah Geological Association
Utah Mining Association
Utah Nature Study Society
Utah Power & Light
Utah Rivers Council
Utah Sportsmen Association
Utah Wildlife & Outdoor Recreation Federation
Utah Wool Growers' Association
Western history Association
Wilderness Society of America
Wildlife Society
Women's Conservation Council of Utah

UTAH CONGRESSIONAL DELEGATION

Senator Orrin Hatch
Senator Robert Bennett
Representative James Hansen
Representative Merrill Cook
Representative Christopher Cannon

INTERESTED/AFFECTED INDIVIDUALS

Permittees
Private Land Inholders



CHAPTER 5 - CONSULTATION AND COORDINATION

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CHAPTER 5 - CONSULTATION AND COORDINATION

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Appendix I

Presidential Proclamation

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APPENDIX 1 - PRESIDENTIAL PROCLAMATION

Establishment of the Grand Staircase-Escalante National Monument by the President of the United States of America September 18, 1996

A PROCLAMATION

The Grand Staircase-Escalante National Monument's vast and austere landscape embraces a spectacular array of scientific and historic resources. This high, rugged, and remote region, where bold plateaus and multi-hued cliffs run for distances that defy human perspective, was the last place in the continental United States to be mapped. Even today, this unspoiled natural area remains a frontier, a quality that greatly enhances the monument's value for scientific study. The monument has a long and dignified human history: it is a place where one can see how nature shapes human endeavors in the American West, where distance and aridity have been pitted against our dreams and courage. The monument presents exemplary opportunities for geologists, paleontologists, archeologists, historians, and biologists.

The monument is a geologic treasure of clearly exposed stratigraphy and structures. The sedimentary rock layers are relatively undeformed and unobscured by vegetation, offering a clear view to understanding the processes of the earth's formation. A wide variety of formations, some in brilliant colors, have been exposed by millennia of erosion. The monument contains significant portions of a vast geologic stairway, named the Grand Staircase by pioneering geologist Clarence Dutton, which rises 5,500 feet to the rim of Bryce Canyon in an unbroken sequence of great cliffs and plateaus. The monument includes the rugged canyon country of the upper Paria Canyon system, major components of the White and Vermilion Cliffs and associated benches, and the Kaiparowits Plateau. That Plateau encompasses about 1,600 square miles of sedimentary rock and consists of successive south-to-north ascending plateaus or benches, deeply cut by steep-walled canyons. Naturally burning coal seams have scorched the tops of the Burning Hills brick-red. Another prominent geological feature of the plateau is the East Kaibab Monocline, known as the Cockscomb. The monument also includes the spectacular Circle Cliffs and part of the Waterpocket Fold, the inclusion of which completes the protection of this geologic feature begun with the establishment of Capitol Reef National Monument in 1938 (Proclamation No. 2246, 50 Stat. 1856). The monument holds many arches and natural bridges, including the 130-foot-high Escalante Natural Bridge, with a 100 foot span, and Grosvenor Arch, a rare "double arch." The upper Escalante Canyons, in the northeastern reaches of the monument, are distinctive: in addition to several major arches and natural bridges, vivid geological features are laid bare in narrow, serpentine canyons, where erosion has exposed sandstone and shale deposits in shades of red, maroon, chocolate, tan, gray, and white. Such diverse objects make the monument outstanding for purposes of geologic study.

The monument includes world class paleontological sites. The Circle Cliffs reveal remarkable specimens of petrified wood, such as large unbroken logs exceeding 30 feet in length. The thickness, continuity and broad temporal distribution of the Kaiparowits Plateau's stratigraphy provide significant opportunities to study the paleontology of the late Cretaceous Era. Extremely significant fossils, including marine and brackish water mollusks, turtles, crocodilians, lizards, dinosaurs, fishes, and mammals, have been recovered from the Dakota, Tropic Shale and Wahweap Formations, and the Tibbet Canyon, Smoky Hollow and John Henry members of the Straight Cliffs Formation. Within the monument, these formations have produced the only evidence in our hemisphere of terrestrial vertebrate fauna, including mammals, of the Cenomanian-Santonian ages. This sequence of rocks, including the overlaying Wahweap and Kaiparowits formations, contains one of the best and most continuous records of Late Cretaceous terrestrial life in the world.

Archeological inventories carried out to date show extensive use of places within the monument by ancient Native American cultures. The area was a contact point for the Anasazi and Fremont cultures, and the evidence of this mingling provides a significant opportunity for archeological study. The cultural resources discovered so far in the monument are outstanding in their variety of cultural affiliation, type and distribution. Hundreds of recorded sites include rock art panels, occupation sites, campsites and granaries. Many more undocumented sites that exist within the monument are of significant scientific and historic value worthy of preservation for future study.

The monument is rich in human history. In addition to occupations by the Anasazi and Fremont cultures, the area has been used by modern tribal groups, including the Southern Paiute and Navajo. John Wesley Powell's expedition did initial mapping and scientific field work in the area in 1872. Early Mormon pioneers left many historic objects, including trails, inscriptions, ghost towns such as the Old Paria townsite, rock houses, and cowboy line camps, and built and traversed the renowned Hole-in-the-Rock Trail as part of their epic colonization efforts. Sixty miles of the Trail lie within the monument, as does Dance Hall Rock, used by intrepid Mormon pioneers and now a National Historic Site.

Spanning five life zones from low-lying desert to coniferous forest, with scarce and scattered water sources, the monument is an outstanding biological resource. Remoteness, limited travel corridors and low visitation have all helped to preserve intact the monument's important ecological values. The blending of warm and cold desert floras, along with the high number of endemic species, place this area in the heart of perhaps the richest floristic region in the Intermountain West. It contains an abundance of unique, isolated communities such as hanging gardens, tinajas, and rock crevice, canyon bottom, and dunal pocket communities, which have provided refugia for many ancient plant species for millennia. Geologic uplift with minimal deformation and subsequent downcutting by streams have exposed large expanses of a variety of geologic strata, each with unique physical and chemical characteristics. These strata are the parent material for a spectacular array of unusual and diverse soils that support many different vegetative communities and numerous types of endemic plants and their pollinators. This presents an extraordinary opportunity to study plant speciation and community dynamics independent of climatic variables. The monument contains an extraordinary number of areas of relict vegetation, many of which have existed since the Pleistocene, where natural processes continue unaltered by man. These include relict grasslands, of which No Mans Mesa is an outstanding example, and pinon-juniper communities containing trees up to 1,400 years old. As witnesses to the past, these relict areas establish a baseline against which to measure changes in community dynamics and biogeochemical cycles in areas impacted by human activity. Most of the ecological communities contained in the monument have low resistance to, and slow recovery from, disturbance. Fragile cryptobiotic crusts, themselves of significant biological interest, play a critical role throughout the monument, stabilizing the highly erodible desert soils and providing nutrients to plants. An abundance of packrat middens provides insight into the vegetation and climate of the past 25,000 years and furnishes context for studies of evolution and climate change. The wildlife of the monument is characterized by a diversity of species. The monument varies greatly in elevation and topography and is in a climatic zone where northern and southern habitat species intermingle. Mountain lion, bear, and desert bighorn sheep roam the monument. Over 200 species of birds, including bald eagles and peregrine falcons, are found within the area. Wildlife, including neotropical birds, concentrate around the Paria and Escalante Rivers and other riparian corridors within the monument.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431) authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Grand Staircase-Escalante National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the document entitled "Grand Staircase-Escalante National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 1.7 million acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from entry, location, selection, sale, leasing, or other disposition under the public land laws, other than by exchange that furthers the protective purposes of the monument. Lands and interests in lands not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

The establishment of this monument is subject to valid existing rights.

Nothing in this proclamation shall be deemed to diminish the responsibility and authority of the State of Utah for management of fish and wildlife, including regulation of hunting and fishing, on Federal lands within the monument.

Nothing in this proclamation shall be deemed to affect existing permits or leases for, or levels of, livestock grazing on Federal lands within the monument; existing grazing uses shall continue to be governed by applicable laws and regulations other than this proclamation.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management, pursuant to applicable legal authorities, to implement the purposes of this proclamation. The Secretary of the Interior shall prepare, within 3 years of this date, a management plan for this monument, and shall promulgate such regulations for its management as he deems appropriate. This proclamation does not reserve water as a matter of Federal law. I direct the Secretary to address in the management plan the extent to which water is necessary for the proper care and management of the objects of this monument and the extent to which further action may be necessary pursuant to Federal or State law to assure the availability of water.

Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this eighteenth day of September, in the year of our Lord nineteen hundred and ninety-six, and of the Independence of the United States of America the two hundred and twenty-first.

William J. Clinton

Appendix 2

Antiquities Act of 1906

APPENDIX 2 - ANTIQUITIES ACT OF 1906

Act of June 18, 1906, 16 U.S.C. 431-433 (Popularly known as the Antiquities Act of 1906)

The following is the text of the Antiquities Act of 1906, under the authority of which President Clinton established Grand Staircase-Escalante National Monument.

16 U.S.C. § 431
National monuments; reservation of lands; relinquishment of private claims:

The President of the United States is authorized, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and may reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected. When such objects are situated upon a tract covered by a bona fide unperfected claim or held in private ownership, the tract, or so much thereof as may be necessary for the proper care and management of the object, may be relinquished to the Government, and the Secretary of the Interior is authorized to accept the relinquishment of such tracts in behalf of the Government of the United States.

16 U.S.C. § 431a
Limitation on further extension or establishment of national monuments in Wyoming:

No further extension or establishment of national monuments in Wyoming may be undertaken except by express authorization of Congress.

Appendix 3

Special Recreation Management Areas

APPENDIX 3 - SPECIAL RECREATION MANAGEMENT AREAS

ESCALANTE CANYONS SPECIAL RECREATION MANAGEMENT AREA (SRMA)

Area Description: The boundary line would follow the geographical topography including all the tributaries to the main Escalante Canyon. It would include trailheads for all the popular routes into the canyons.

Activities: Backpacking, canyoneering, non-motorized boating, and equestrian use.

Desired Future Condition: The overall recreation experience would continue to be primitive, uncrowded and remote. Overall social encounters would remain low compared to other southwest canyon hiking opportunities. However, a range of social encounters would be available, from experiences where parties would be encountered to where there would be little or no contact with others. People would be able to make informed decisions about which recreation opportunities meet their desires, and have their expectations met. Monument resources would not be impaired. Potential permit systems could address general public, commercial, and research users.

PARIA/HACKBERRY SRMA

Area Description: This area would be bordered on the west by Kitchen Canyon road, on the east by Cottonwood Canyon Road corridor, the confluence of Hackberry/Cottonwood creeks and the Paria river on the south, and the Dixie National Forest on the north excluding the Skutumpah corridor.

Activities: Backpacking, canyoneering, and equestrian use.

Desired Future Condition: The overall recreation experience would continue to be primitive, uncrowded and remote. Equestrian opportunities would be emphasized in Paria Canyon while backpacking opportunities would be emphasized in Hackberry Canyon. Potential permit systems could address general public, commercial, and research users.

FIFTYMILE MOUNTAIN SRMA

Area Description: Geographical area called Fiftymile Mountain including trail access points.

Activities: Equestrian use, backpacking, and hunting.

Desired Future Condition: The recreation experience would be primitive, uncrowded and remote. Visitors would not be encouraged to go to this area and commercial outfitting would be extremely limited. Research projects would also be kept at low levels for this area.

HOLE-IN-THE-ROCK ROAD CORRIDOR SRMA

Area Description: Hole-in-the-Rock Road corridor would be defined as the zone between the Escalante Canyons SRMA, the Fiftymile Mountain SRMA, and Glen Canyon NRA. This corridor would include Hole-in-the-Rock Road, historic Hole-in-the-Rock Trail route, Devils Garden Outstanding Natural Area/Instant Study Area, Batty Pass Caves Historic Site, Dance Hall Rock Historic Site, Chimney Rock, access to backcountry trailheads (Harris Wash, Dry Fork Coyote, Coyote Gulch, Hurricane Wash, etc.) and access to Glen Canyon NRA and Hole-in-the-Rock.

Activities: Scenic driving, all-terrain vehicle riding, day use hiking, picnicking, family gatherings, camping, equestrian use, mountain bicycling, photography, scenic and interpretive viewing.

Desired Future Condition: The recreation experience would focus on learning about pioneer history, geology, and biology as well as scenic viewing. In addition, this corridor would be an outstanding area to interpret and demonstrate range management and future management of range resources.

This corridor has been very popular for dispersed camping and large family outings. Primitive group camping areas would be developed to accommodate this traditional use while protecting areas from overuse.

Designated primitive camping areas could also be identified for individual campers.

HIGHWAY 12 CORRIDOR SRMA

Area Description: The Highway 12 corridor located in the Monument. Includes Calf Creek Campground and Interpretive Trail, and Deer Creek Campground

Activities: Scenic driving, day use hiking, camping, equestrian use, road bicycling, scenic and interpretive viewing.

Desired Future Condition: The recreation experience would focus on learning about geology, history, archeology, biology, paleontology in addition to scenic viewing. Short interpretive trails and scenic overlooks would be developed to encourage visitors to learn more about these Monument resources. Opportunities would accommodate all visitors. Information stations located in Boulder, Escalante, and Cannonville would disseminate educational materials to further information about these resources.

HIGHWAY 89 CORRIDOR SRMA

Area Description: Highway 89 corridor located in the Monument. This special recreation management area would encompass the Paria Movie Set and the old Paria townsite and the Paria Contact Station.

Activities: Scenic driving, day use hiking, camping, road and mountain bicycling, scenic and interpretive viewing.

Desired Future Condition: The recreation experience would focus on learning about geology, history, archeology, biology, and paleontology in addition to scenic viewing. Short interpretive trails and scenic overlooks would be developed to encourage visitors to learn more about these Monument values. Opportunities would accommodate all visitors. This corridor would be coordinated with the Vermilion Cliffs Highway Project.

Appendix 4

Wild and Scenic River Eligibility

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

WILD AND SCENIC RIVER ELIGIBILITY FINDINGS

The Wild and Scenic Rivers Act (October 2, 1968, Public Law 90-542) requires the Bureau of Land Management to consider wild and scenic river values in its land use planning process. The objective of the Wild and Scenic Rivers Act is to preserve in free-flowing condition selected rivers in the Nation which possess outstandingly remarkable values and to protect those rivers and their immediate environments for the benefit of present and future generations.

On November 6, 1997, the Bureau of Land Management's Utah State Director signed a Memorandum of Understanding (MOU) concerning wild and scenic river studies in Utah with the Governor of Utah, the Regional Forester of the Forest Service, the Intermountain Regional Director of the National Park Service, and affected local agencies. The Memorandum of Understanding establishes a cooperative relationship among the agencies for conducting wild and scenic river studies for Utah rivers. Under the Memorandum of Understanding, an interagency team was established to jointly evaluate river segments in the Monument and adjoining Federal lands [Dixie National Forest (NF), Bryce Canyon National Park (NP) and Glen Canyon National Recreation Area (NRA)]. Together, the team made eligibility findings for stream segments, including those which crossed agency boundaries. This coordinated interagency approach applied consistent criteria across agency jurisdictions, and looked at entire streams and logical watershed units in the study area. Actual designation of river segments would only occur through congressional action or as a result of Secretarial decision at the request of the Governor in accordance with provisions of the Wild and Scenic Rivers Act (WSRA). While this section outlines eligibility findings for the entire study area, suitability assessments will be done by individual agencies only for segments on their lands, due to differing planning procedures and time lines. The suitability study for segments on Grand Staircase-Escalante National Monument (GSENM) are found in Appendix 5.

Determining preliminary eligibility of individual river segments for possible inclusion into the National Wild and Scenic River System was accomplished by a team of Bureau of Land Management, United States Forest Service, and National Park Service specialists in February of 1998. The team used personal knowledge, 1994 Bureau of Land Management river evaluations and 32 layers of Geographic Information System (GIS) resource and land information to conduct the evaluations.

Following criteria established in the Wild and Scenic Rivers Act and outlined in Bureau of Land Management Manual 8351 and Forest Service Handbook 1909.12, the team determined whether or not each of the inventory segments was free-flowing and possessed one or more outstandingly remarkable values (ORVs). The values considered were: scenic, recreational, geological, fish and wildlife, historic, cultural, and other similar values such as ecological (riparian), botanical, paleontological, hydrological, and scientific study. Land uses were not considered in this phase. Inventory segments determined non-eligible were either not free-flowing or lacked any of the outstandingly remarkable value. Some non-eligible segments possessed one or more value, but when viewed in the regions of comparison, they were not outstandingly remarkable.

Regions of comparison were established for each of the outstandingly remarkable values. They are listed as follows:

Colorado Plateau:

- botanical
- archeological
- geological
- paleontological
- ecological
- wildlife
- fisheries
- scientific study

Wild and Scenic River Study Area (Grand Staircase-Escalante National Monument, Glen Canyon National Recreation Area, Dixie National Forest):

- recreational
- scenic
- hydrological

Southern Utah and Northern Arizona:

- historic
- cultural

The following guidelines were followed when conducting this preliminary evaluation:

1. Threatened and endangered species known to occur in the river corridor automatically became an outstandingly remarkable value.
2. Potential wildlife habitat without confirmed species sightings did not become an outstandingly remarkable value.
3. Habitat for common wildlife species was not an outstandingly remarkable value.
4. Cultural and paleontological sites were used as supporting outstandingly remarkable values only, one of these sites by itself did not warrant preliminary listing.
5. Scenic outstandingly remarkable value were determined by using existing scenic quality inventories. In some cases, personal on-the-ground knowledge took precedence over the automated inventory data.

ELIGIBILITY FINDINGS

Subject matter experts and the public were invited to comment on the preliminary findings. Six public comments and 26 subject matter expert comments were received. Subject matter expert comments provided information and varied from suggesting many additional river segments be added to stating that none of the segments possessed outstandingly remarkable values.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

Summary of Public Comments

A. Deer Creek has an irrigation pipeline and right-of-way for maintenance. A water right also exists.

B. All waterways within the Monument should be designated.

C. Bull Valley Gorge should be classified as Wild instead of Scenic. Willis Creek is free flowing.

D. All riparian areas within the monument should be designated. Designation should not bring any improvements or restrictions on hiking with pack dogs.

E. Agrees with the interagency team's recommendations.

F. Utah Rivers Council asked questions regarding land uses in the river corridors [NOTE: land uses were not considered during eligibility determinations unless they affect the free-flowing nature of the segment]. They also asked specific questions on the beginning and ending of segments, preferring a land survey description (township, range and section) rather than using the map and landmark description provided.

In May of 1998, the interdisciplinary team reconvened to make final eligibility determinations. Final eligibility determinations were accomplished by looking at each segment and determining if the comments warranted changes in the preliminary findings. Again, the team only considered free-flowing nature and outstandingly remarkable values viewed in the regional context. Based on additional information and the comments received, several segments were added to the eligible list, bringing the total to 47. The tentative classification was changed for others. The results are shown in the eligible segments table. All eligible segments will be carried forward to the suitability assessment phase of Wild and Scenic River studies.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

TABLE A4.1
ELIGIBLE RIVER SEGMENTS

WATERSHED NAME	RIVER SEGMENT NAME	SEGMENT DESCRIPTION	OUTSTANDINGLY REMARKABLE VALUES	TENTATIVE CLASSIFICATION	RESPONSIBLE LAND MANAGER
Escalante River Basin					
Alvey Wash/ Harris Wash	Harris Wash	Tenmile Crossing (Hole-in-the-Rock Road) to Escalante River	Scenic Recreational Wildlife Cultural Historic	• Tenmile Crossing to Bighorn Wash - Scenic • Bighorn Wash to unnamed road - Wild • Road to west side of state section - Scenic • State section to Escalante River - Wild	GSENM, Glen Canyon NRA
Boulder Creek	Lower Boulder Creek	Downstream side of State section to Escalante River	Scenic, Recreational, Cultural	Wild	GSENM
	East Fork Boulder Creek	Immediately below Boulder Top to upstream side of King's Pasture	Scenic, Recreational, Fish	Wild	Dixie NF
	*Dry Hollow Creek	3/4 mile above Monument boundary to Lower Boulder Creek	Scenic	Wild	GSENM
	*Slickrock Canyon	Headwaters (6720') to Deer Creek	Scenic, Recreational, Cultural, Ecological	Wild	GSENM, Dixie NF
	*Cottonwood Canyon	Headwaters to Lower Deer Creek	Scenic, Recreational, Cultural	Wild	GSENM, Dixie NF
	Lower Deer Creek	Slickrock Canyon to Lower Boulder Creek	Scenic, Recreational, Wildlife, Cultural, Botanical, Ecological	• Slickrock Canyon to Burr Trail - Recreational • Burr Trail to Escalante River - Wild	GSENM

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

WATERSHED NAME	RIVER SEGMENT NAME	SEGMENT DESCRIPTION	OUTSTANDINGLY REMARKABLE VALUES	TENTATIVE CLASSIFICATION	RESPONSIBLE LAND MANAGER
Coyote Gulch	Coyote Gulch	• Confluence of Big Hollow Wash with Coyote Gulch (T39S, R7E, Sec 10), downstream to confluence with Escalante River. • Includes approximately 3/4 mile BLM segment in T39S, R7E, Sec 13	Scenic, Recreational, Geological, Wildlife	Wild	Glen Canyon NRA
Fortymile Wash	Fortymile Gulch (Wash)	Confluence of Carcass Wash with Fortymile Gulch (T40S, R8E, Sec 8), downstream to confluence with Willow Gulch (T40S, R8E,Sec 13)	Scenic, Cultural, Wildlife, Paleontological	Wild	Glen Canyon NRA
	Davis Gulch	Hole-in-the-Rock Road (T41S, R8 1/2E, Sec 11) downstream to Lake Powell normal full pool elevation	Scenic, Cultural, Historic	Wild	Glen Canyon NRA
	Fiftymile Creek	Hole-in-the-Rock Road (T41S, R8E, Sec 11) downstream to Lake Powell full pool elevation	Scenic, Cultural	Wild	Glen Canyon NRA
	Willow Gulch	Hole-in-the-Rock Road (T40S, R8E, Sec 27) downstream to Lake Powell normal full pool elevation (3,700' MSL)	Scenic, Recreational Geological, Fish, Cultural, Paleontological	Wild	Glen Canyon NRA
	* Cow Canyon	Entire canyon downstream to Lake Powell normal full pool elevation	Scenic, Cultural	Wild	Glen Canyon NRA
	* Fence Canyon	Entire canyon downstream to Lake Powell normal full pool elevation	Scenic	Wild	Glen Canyon NRA

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

WATERSHED NAME	RIVER SEGMENT NAME	SEGMENT DESCRIPTION	OUTSTANDINGLY REMARKABLE VALUES	TENTATIVE CLASSIFICATION	RESPONSIBLE LAND MANAGER
The Gulch	The Gulch, *Blackwater Canyon, *Lamanite Arch Canyon, and *Water Canyon	• Headwaters and tributaries to Escalante River • Includes Blackwater, Lamanite Arch Canyon and Water Canyon	Scenic, Recreational, Cultural	• Headwaters to Forest Road #1472 - Wild, Along road - Recreational • Road #1472 to Burr Trail Road - Wild • Along Burr Trail - Recreational • Below Burr Trail - Wild • Black Water, Lamanite, and Water Canyons - Wild	GSENM, Dixie NF
	*Steep Creek	Headwaters approx. 1 mile below HWY 12 to The Gulch	Scenic, Recreational, Ecological	Wild	GSENM Dixie NF
Horse Canyon	Lower Horse Canyon	Outstanding Natural Area boundary to Escalante River	Scenic, Recreational, Paleontological	Wild	GSENM
	*Wolverine Creek	Entire	Scenic	Wild	GSENM
	*Little Death Hollow	Entire	Scenic, Recreational	Wild	GSENM
Moody Creek	Choprock Canyon	Main stem from confluence of north and south forks (T36S, R7E, Sec 21) downstream to confluence with Escalante River	Scenic, Cultural	Wild	Glen Canyon NRA
	Neon Canyon	From Golden Cathedral pouroff (T37S, R7E, Sec 5) downstream to confluence with Escalante River	Scenic, Recreational	Wild	Glen Canyon NRA
	Silver Falls Creek	From confluence with North Fork (Sec 5, T36S, R7E) downstream to confluence with Escalante River	Scenic, Historic	Wild	Glen Canyon NRA

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

WATERSHED NAME	RIVER SEGMENT NAME	SEGMENT DESCRIPTION	OUTSTANDINGLY REMARKABLE VALUES	TENTATIVE CLASSIFICATION	RESPONSIBLE LAND MANAGER
Moody Creek	Moody Creek	From where road leaves river corridor (T36S, R8E, Sec 31) downstream to confluence with Escalante River	Scenic, Botanical	Wild	Glen Canyon NRA
	East Moody Creek	Entire Canyon	Scenic	Wild	Glen Canyon NRA
Pine Creek	Pine Creek	Pine Creek Box Section from north to south wilderness boundaries	Scenic, Recreational, Geological, Ecological	Wild	Dixie NF
Sand Creek	Escalante River	Pine Creek confluence to Coyote Gulch/Lake Powell (section extends into Moody Creek and Stevens Canyon Watersheds)	Scenic, Recreational, Geological, Fish , Wildlife, Cultural, Historic, Ecological, Paleontological	• Pine Creek to Highway 12 - Wild • Highway 12 to east side of private land - Recreational • Private land to Coyote Gulch - Wild	GSENM, Glen Canyon NRA
	Lower Sand Creek and *Willow Patch Creek	Sweetwater Creek to Escalante River	Scenic, Recreational, Fish, Historic, Ecological, Wildlife	Wild	GSENM
	Mamie Creek and west tributary	Headwaters on Dixie National Forest to Escalante River	Scenic, Recreational, Geological, Fish, Wildlife, Cultural, Ecological, Historical	Wild	GSENM, Dixie NF
	Death Hollow Creek	Headwaters on Dixie National Forest within Box-Death Hollow Wilderness to Mamie Creek	Scenic, Recreational, Cultural, Wildlife, Paleontological, Ecological	Wild	GSENM, Dixie NF
	Calf Creek	Headwaters to Escalante River	Scenic, Recreational, Wildlife, Cultural	• Headwaters to Lower falls - Wild • Lower falls to campground - Scenic • Campground to Escalante River - Recreational	GSENM
	*Phipps Wash and tributaries	Top to Escalante River	Scenic, Recreational	Wild	GSENM

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

WATERSHED NAME	RIVER SEGMENT NAME	SEGMENT DESCRIPTION	OUTSTANDINGLY REMARKABLE VALUES	TENTATIVE CLASSIFICATION	RESPONSIBLE LAND MANAGER
Sand Creek	*Unnamed Tributary (West of Calf Creek)	Top to Escalante River	Scenic, Recreational, Geological, Cultural	Wild	GSENM
Twentyfive Mile Wash	Twentyfive Mile Wash	Rat Seep Hollow to Escalante River and unnamed wash on north side.	Recreational, Cultural	Wild	GSENM, Glen Canyon NRA
Stevens Canyon	Georgie's Canyon	Entire canyon including both forks	Scenic	Wild	Glen Canyon NRA
	Scorpion Gulch	Entire canyon, including approximately .15 mile administered by BLM.	Scenic	Wild	Glen Canyon NRA
	Fools Canyon	Entire canyon	Scenic	Wild	Glen Canyon NRA
	Fold Canyon	Entire canyon including the three main branches at the upper end	Scenic	Wild	Glen Canyon NRA
	Eastside Tributaries #1, 2, 3 (Sheep Canyon), 4	Four unnamed tributaries that drain to the west between upper Stevens Canyon and Escalante River; entire canyons of each	Scenic	Wild	Glen Canyon NRA
	Stevens Canyon	Entire canyon	Scenic	Wild	Glen Canyon NRA

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APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

WATERSHED NAME	RIVER SEGMENT NAME	SEGMENT DESCRIPTION	OUTSTANDINGLY REMARKABLE VALUES	TENTATIVE CLASSIFICATION	RESPONSIBLE LAND MANAGER
Paria River Basin					
Henrieville Creek Watershed	Yellow Creek	Segment on Bryce Canyon N.P.	Scenic, Wildlife, Historic, Recreational	Wild	Bryce NP
Sheep Creek	Paria River, including Deer Creek Canyon, Snake Creek, Hogeye Creek, *part of Kitchen Canyon, *Starlight Canyon, and Cottonwood Creek	Little Dry Valley to downstream side of private property below Highway 89 (Paria segment extends into Henrieville Creek and Paria River Watersheds)	Scenic, Recreational, Historic, Geological	• Paria - Recreational • Deer Creek - Wild • Snake - Wild • Hogeye - Wild • Kitchen - Wild • Starlight - Wild • Cottonwood Creek-Recreational	GSENM
	Bull Valley Gorge	Little Bull Valley to Sheep Creek	Scenic, Recreational, Geological, Wildlife	Wild	GSENM
	Lower Sheep Creek	Bull Valley Gorge to Paria River	Scenic, Recreational	Scenic	GSENM
	Sheep Creek	Segment on Bryce Canyon N.P.	Scenic, Geological, Wildlife, Historical	Wild	GSENM
Cottonwood Creek	Hackberry Canyon	Top to Cottonwood Creek	Recreational, Wildlife, Ecological	Scenic	GSENM
Park Wash	Buckskin Gulch	Wilderness boundary to Paria River, includes Wire Pass	Scenic, Recreational, Wildlife, Geological	Wild	Wilderness
Paria River	Lower Paria River	From where river leaves private land to Arizona State line	Scenic, Recreational, Wildlife, Geological	• Private land to wilderness boundary- Recreational • Segment in wilderness - Wild	GSENM, Kanab Field Office

* = Segments added on May 28, 1998 after receiving public comments and additional information.

Eligible River Segments

Criteria for eligibility: the segment must be free-flowing and possess at least one Outstandingly Remarkable Value when viewed in the regional context.

Ecologic value includes riparian and other significant natural communities or processes

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

TABLE A4.2
WILD AND SCENIC RIVER STUDY SEGMENTS FOUND NOT ELIGIBLE

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Alvey Wash/Harris Wash Watershed		
Alvey Wash #1	Yes	Not significant in region of comparison. Chukars are common and non-native, not outstandingly remarkable.
Dave Canyon	Yes	Not significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Bull Run Canyon	Yes	Not significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Unnamed Wash	Yes	Potential spotted owl habitat, but no actual sightings.
Trap Canyon	Yes	Potential spotted owl habitat, but no actual sightings. Not outstanding recreation, no supporting information provided to qualify as recreation outstandingly remarkable value.
Little Valley Wash	Yes	Potential spotted owl habitat, but no actual sightings. Potential cultural sites. Not significant in region of comparison.
Horse Spring Canyon	Yes	Potential spotted owl habitat, but no actual sightings. Deer are common and habitat not outstandingly remarkable value, not outstandingly scenic.
Canaan Creek	Yes	Potential spotted owl habitat, but no actual sightings. Deer habitat not outstandingly remarkable value.
Willow Creek	Yes	Potential spotted owl habitat, but no actual sightings. Elk and deer habitat not outstandingly remarkable value, not outstanding recreational and scenic values, and no supporting information for recreational or scenic outstandingly remarkable values provided.
Mitchell Canyon	Yes	Not significant in region of comparison.
Halfway Hollow	Yes	Not significant in region of comparison. Not outstandingly scenic or recreational, no information provided to support scenic or recreational outstandingly remarkable values.
Cottonwood Wash	Yes	Potential spotted owl habitat, but no actual sightings. Not significant in region of comparison. Not outstandingly scenic or recreational, no information provided to support scenic or recreational outstandingly remarkable values.
Big Horn Wash	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Potential spotted owl habitat, but no actual sightings.
"North" Washes	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Not outstanding for scenic, geological, or cultural values. No information provided to support the segments as having at least one outstandingly remarkable value.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Coal Bed Canyon	Yes	Potential spotted owl habitat, but no actual sightings. Scenic and recreational values not outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Alvey Wash #2	No	Not significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Twitchell Canyon	Yes	Potential spotted owl habitat, but no actual sightings. Not significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Calf Canyon	Yes	Potential spotted owl habitat, but no actual sightings. Not significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
4 Cedar Washes	Yes	Not significant in region of comparison.
Birch Creek Watershed		
Upper Escalante River	No	Possible cultural sites but not significant in region of comparison. Wild turkey not outstanding.
Birch Creek (Main Canyon)	No	Wild turkey not outstanding, geology, scenery, recreation not deemed outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Pet Hollow	Yes	Not significant in region of comparison.
Upper Valley Creek/ Allen Creek	No	Possible cultural sites but not significant in region of comparison. Scenery, geology not deemed outstanding. No information provided to support these outstandingly remarkable values.
North Creek, East Fork North Creek and tributaries: Meadow Canyon, Jake Hollow, West Fork North Creek, White Creek, Twitchell Creek, Griffin Creek, Beck Hollow	Yes	Although river segment has potential spotted owl, neotropical habitat, Ocher sites, traditional cultural American Indian properties, and is a riparian system, it was not found significant in the region of comparison. Wild turkey, elk, deer and waterfowl are common, fisheries are not outstanding, fishing in reservoir not river, recreation and scenery not deemed outstanding, no information provided to support these outstandingly remarkable values, same with riparian, no documented spotted owl.
Varney Griffin & tributaries	Yes	Although river segment has potential spotted owls, contains prehistoric and historic sites, and is a riparian system, it was not found significant in the region of comparison.
Dead Mare Wash, Water Canyon, South Hollow, Left Hand Allen Creek		Elk and deer habitat not outstanding value, geology and recreation not found outstanding, no information provided to support them as outstandingly remarkable values.
Wide Hollow Wash	Yes	Not significant in region of comparison. Trout and waterfowl are common and are in reservoir not river.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Right Fork Wide Hollow	Yes	Not significant in region of comparison. Scenery and recreation not found to be outstanding, no info provided to support these as outstandingly remarkable values.
Boulder Creek Watershed		
West Fork Boulder Creek	No	Wild turkey, elk not outstanding values, Bonneville cutthroat trout not outstanding unless in early populations that are being transplanted. Flows altered by Spectacle Reservoir and West Fork Reservoir diversion.
Middle Boulder Creek	No	Diverted at King's Pasture, enough water is taken that affects the hydro regime for the rest of this segment, turkey and elk are not outstandingly remarkable values, recreation was not found outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Upper Deer Creek	No	Diverted for irrigation in upper reach, not outstandingly scenic or recreational, no information provided to support the segments as having at least one outstandingly remarkable value, turkey and elk are common and not outstandingly remarkable values.
Hot Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Cultural not outstandingly remarkable value, no information provided to support the segments as having at least one outstandingly remarkable value.
Coyote Gulch Watershed		
Coyote Gulch #1	Yes	Not significant in region of comparison.
Hurricane Wash	Yes	Not significant in region of comparison.
Big Hollow Wash	Yes	Not significant in region of comparison.
Dry Fork Coyote	Yes	Although Peek-a-Boo and Spooky canyons receive international visitation, slot canyons in and of themselves do not fit the criteria for being a wild and scenic river. No information provided to support the segments as having at least one outstandingly remarkable value.
Brimstone Gulch	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison.
Fortymile Wash Watershed		
Sooner Wash	Yes	Not found to be outstandingly scenic or recreational. No information provided to support the segments as having at least one outstandingly remarkable value.
Carcass Wash	Yes	Not significant in region of comparison. Cultural, geology, recreation not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Left Fork Fortymile Gulch	Yes	Not significant in region of comparison.
Right Fork Fortymile Gulch	Yes	Not significant in region of comparison.
		The Gulch Watershed
Long Canyon	No	Road through it, not free flowing, is scenic, but not because of riverine values, geologic, cultural not found outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Halfway Hollow	Yes	Not significant in region of comparison.
		Henrieville Creek Watershed
Paria River #1 (Headwaters to Water Canyon bridge)	Yes	Not significant in region of comparison. Turkey habitat not an outstandingly remarkable value, scenic, cultural and hydrology not found outstanding, minor diversions exist.
Paria River #2 (Little Dry Valley to Monument Valley)	No	Not significant in region of comparison.
Merrill Hollow and Tributaries	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Wild turkey habitat not an outstandingly remarkable value.
Henrieville Creek #1 (Highway 12 to Paria)	No	Not significant in region of comparison.
Henrieville Creek #2 (Headwaters to Highway 12, including FS)	Yes	Not significant in region of comparison.
Dry Creek and tributaries	Yes	Not significant in region of comparison.
Shurtz Bush Creek	Yes	Not significant in region of comparison.
Little Creek	Yes	Not significant in region of comparison.
Rock Springs Creek	Yes	Not significant in region of comparison.
Dry Valley Creek	Yes	Not significant in region of comparison.
Wiggler Wash	Yes	Not significant in region of comparison. Tropic shale fairly common, geology not outstanding.

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APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Mud Spring Canyon	Yes	Not significant in region of comparison. Geology and recreation not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Horse Creek Canyon	Yes	Not significant in region of comparison. Geology, recreation and cultural values not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Cedar Wash	Yes	Not significant in region of comparison.
Horse Canyon Watershed		
Upper Horse Canyon	Yes	Not significant in region of comparison.
Middle Horse Canyon	Yes	Not significant in region of comparison. Bighorn habitat not an outstandingly remarkable value.
Upper Washes	No	Not significant in region of comparison.
West Wash	Yes	Not significant in region of comparison.
White Canyon	No	Not significant in region of comparison.
Moody Creek Watershed		
Unnamed washes (1)	Yes	Not significant in region of comparison. Bighorn habitat not an outstandingly remarkable value.
North Fork Silver Falls Creek	Yes	Not significant in region of comparison. Bighorn habitat not an outstandingly remarkable value.
Dry Fork Silver Falls Creek	Yes	Not significant in region of comparison.
Middle Moody	Yes	Not significant in region of comparison.
Pine Creek Watershed		
Upper Pine Creek	Yes	Not significant in region of comparison. Potential Bonneville cutthroat not an outstandingly remarkable value, turkey, elk and recreation fishery common.
Lower Pine Creek	Yes	Not significant in region of comparison. Recreation fishery common. No information provided to support the segments as having at least one outstandingly remarkable value.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Sand Creek Watershed		
Upper Sand Creek (on USFS)		Not significant in region of comparison. Turkey and elk habitat not outstandingly remarkable values. No information provided to support the segments as having at least one outstandingly remarkable value.
Salt Water Creek	Yes	Found to have scenic quality A in visual resource management criteria but not found significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Big Hollow	Yes	Not significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Sand Hollow	Yes	Found to have scenic quality A in visual resource management criteria but not found significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Sweetwater Creek	Yes	Although this is a riparian area and has cultural sites, it was not found significant in region of comparison. No information provided to support the segments as having at least one outstandingly remarkable value.
Twentyfive Mile Wash Watershed		
Twentyfive Mile Wash #1	Yes	Although potential spotted owl habitat, neotropicals, and southwestern willow flycatcher, no actual sightings have been documented. Not significant in region of comparison.
Rat Seep Hollow	No	Not significant in region of comparison. Chukar common and non-native, not an outstandingly remarkable value.
Left Hand Collet Canyon	No	Not significant in region of comparison.
Lower Trail Canyon	No	Not significant in region of comparison.
Willard Canyon	Yes	Although potential spotted owl habitat, no actual sightings have been documented. Recreation and bird habitat not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Right Hand Collet Canyon	Partially	Not significant in region of comparison.
Long Canyon/ Relishen Canyon	Yes	Not significant in region of comparison.
Star Seep Canyon	Yes	Not significant in region of comparison.
Sarah Ann Canyon	Yes	Not significant in region of comparison.
Unnamed wash (2)	Yes	Not significant in region of comparison.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Carcass Canyon	Yes	Not significant in region of comparison. Geology and recreation not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
North tributaries Carcass Canyon	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value, recreation not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Devils Garden	No	Not significant in region of comparison.
Little Valley Wash	No	Not significant in region of comparison.
Steer Canyon	Yes	Not significant in region of comparison. Geology and recreation not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Horse Canyon	Yes	Not significant in region of comparison. Recreation, geology and cultural not found to be outstanding, no supporting evidence given for those outstandingly remarkable values.
Henderson Creek Watershed		
Bulldog Hollow	Yes	Not significant in region of comparison. Wild turkey common, not an outstandingly remarkable value.
Bryce Creek	Yes on NPS, No on BLM	Not significant in region of comparison. Wild turkey not an outstandingly remarkable value, Bryce geology not uncommon.
Campbell Creek	Yes	Not significant in region of comparison. Paleontological values not deemed to be outstanding.
Cope Canyon	Yes	Not significant in region of comparison.
Box canyon	Yes	Not significant in region of comparison.
Dry Canyon	Yes	Not significant in region of comparison.
North Creek	Yes	Not significant in region of comparison.
Cedar Fork	Yes	Not significant in region of comparison.
Paradise Creek	Yes	Not significant in region of comparison.
Pasture Canyon	Yes	Not significant in region of comparison.
Unnamed tributary of Cedar Fork	Yes	Not significant in region of comparison.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Pasture Canyon Tributary 1	Yes	Not significant in region of comparison.
Henderson Creek	Yes	Not significant in region of comparison.
Wildcat Wash	Yes	Not significant in region of comparison.
Sheep Creek Watershed		
Indian Hollow #1	No	Not significant in region of comparison.
Indian Hollow #2	No	Not significant in region of comparison.
Bull Run	Yes	Not significant in region of comparison.
Squaw and Papoose Creeks	Yes	Not significant in region of comparison. Not outstandingly scenic, narrows very short, some diversions.
Little Bull Valley	Yes	Not significant in region of comparison.
Willis Creek	Partially	Although potential spotted owl habitat, no actual sightings have been documented. Several diversions, is not free flowing as suggested in public comment.
Averett Creek	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Turkey habitat not an outstandingly remarkable value, scenery not found outstanding, no information given to support that outstandingly remarkable value.
Sheep Creek	Partially	Not significant in region of comparison. Deer are common and not an outstandingly remarkable value.
Heward Creek	Yes	Not significant in region of comparison.
Jim Hollow	Yes	Not significant in region of comparison.
Pasture Wash	Yes	Not significant in region of comparison.
Cottonwood Creek Watershed		
Cottonwood Creek #1	No	Not significant in region of comparison.
Death Valley	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. No riparian here, no unique geological features, not significant cultural values, no information given to support potential outstandingly remarkable values.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Round Valley Draw	Yes	Not significant in region of comparison. Not significant riparian or cultural values.
		Johnson Canyon Watershed
Johnson Wash	No	Not significant in region of comparison. Deer, turkey not outstandingly remarkable values.
Swapp Canyon	Yes	Not significant in region of comparison. Deer are not an outstandingly remarkable value.
Fisher Canyon	Yes	Not significant in region of comparison. Turkey not an outstandingly remarkable value, cultural not found to be outstanding.
Thompson Creek Complex	Yes	Not significant in region of comparison. Cultural and grouse on flats not in river corridor. No information provided to support the segments as having at least one outstandingly remarkable value.
Skutumpah Creek Complex	No	Not significant in region of comparison. No significant cultural or recreation values, wildlife listed are common, sage grouse common and on flats not in river corridor.
Cottonwood Canyon Complex	Partially	Not significant in region of comparison.
Johnson Lakes Complex	No	Not significant in region of comparison. outstandingly remarkable value values found on lake not in river corridor.
Upper Flood Canyon Complex	Yes	Not significant in region of comparison. Deer not an outstandingly remarkable value.
Lower Flood Canyon	No	Not significant in region of comparison.
		Park Wash Watershed
Buckskin Gulch #2	Yes	Not significant in region of comparison. No slot canyons, geological values are not outstanding.
Kitchen Corral Wash	Yes	Although this segment has cultural sites, not significant in region of comparison. Other historic values are not outstanding.
Coyote Wash	No	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison.
Telegraph Wash	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value.
Clay Hole Wash	No	Not significant in region of comparison. Deer habitat and petrified wood not outstandingly remarkable values.
Fin Little Wash	No	Not significant in region of comparison. Deer not an outstandingly remarkable value, scenery not found to be outstanding, impoundments.
Deer Spring Wash	Partially	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value, scenery and historic values not found to be outstanding.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Nephi Wash	No	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value, scenic and historic values not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Adams Wash	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value.
Meadow Canyon	No	Not significant in region of comparison. Turkey not an outstandingly remarkable value.
Dunham Wash	Yes	Not significant in region of comparison.
Park Wash	Partially	Not significant in region of comparison. Scenery and historic values not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value. Upper part not free flowing.
Lick Wash	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value.
Lower Podunk Creek	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value.
Box Elder Wash	Yes	Not significant in region of comparison.
Deer Range Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Potential for spotted owl but no known sightings. Deer habitat not an outstandingly remarkable value.
Tank Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison.
Paria River Watershed		
Sand Gulch	No	Not significant in region of comparison.
Seaman Wash Watershed		
Seaman Wash	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value.
White Sage Wash	Yes	Not significant in region of comparison. Deer habitat not an outstandingly remarkable value.
Petrified Hollow	Yes	Not significant in region of comparison. Deer habitat and petrified wood not outstandingly remarkable values.
Wahweap Creek Watershed		
Wahweap Creek	Yes	Not significant in region of comparison. No outstandingly remarkable values, we did not look at grazing, etc as Utah River Coalition suggests, cultural, geology, riparian are not significant, no information provided to support those as outstandingly remarkable values.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Blue Wash	Yes	Not significant in region of comparison.
Long Flat Canyon	Yes	Not significant in region of comparison.
Tommy Canyon	Yes	Not significant in region of comparison. Cultural sites alone not outstanding, water not an outstandingly remarkable value.
Fourmile Canyon	Yes	Not significant in region of comparison. Geology not found to be outstanding, no information to support that outstandingly remarkable value.
Smith Run	Yes	Not significant in region of comparison. Bighorn not an outstandingly remarkable value.
Ty Hatch Creek Wet Fork	Yes	Riparian, geology, Paleontology and scenery not found to be significant, no information given to support them as outstandingly remarkable values, bighorn not an outstandingly remarkable value.
Ty Hatch Creek Dry Fork	Yes	Riparian, geology, Paleontology and scenery not found to be significant, no information given to support them as outstandingly remarkable values, bighorn not an outstandingly remarkable value.
Nipple Creek	Yes	Not significant in region of comparison. Scenery and wildlife habitat not found outstanding, no information given to support those outstandingly remarkable values.
Warm Creek Watershed		
Warm Creek	No	Not significant in region of comparison. Bighorn not an outstandingly remarkable value.
Tibbets Canyon	No	Not significant in region of comparison. Bighorn not an outstandingly remarkable value.
John Henry Canyon	Yes	Not significant in region of comparison. Recreation and Paleontology not found outstanding, no information given to support those outstandingly remarkable values, bighorn not an outstandingly remarkable value.
Wesses Canyon	Yes	Not significant in region of comparison. Bighorn habitat not an outstandingly remarkable value, cultural not significant.
Smoky Hollow	No	Not significant in region of comparison. Bighorn and chukar not outstanding.
Last Chance Watershed		
Last Chance Creek	Yes	Potential spotted owl habitat but no actual sightings. Geologic formation not outstanding and not river value, bighorn not an outstandingly remarkable value.
Drip Tank Canyon	Yes	Not significant in region of comparison. Bighorn not an outstandingly remarkable value.

APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Paradise Canyon	Yes	Not significant in region of comparison. Road through, not outstandingly scenic, no information to support scenery or recreation, cultural not found outstanding.
Dry Wash	Yes	Not significant in region of comparison. Bighorn not an outstandingly remarkable value.
Reese Canyon	Yes	Not significant in region of comparison. Chukar, bighorn not outstandingly remarkable values.
Button Canyon	Yes	Not significant in region of comparison. Chukar not an outstandingly remarkable value.
Little Escalante Canyon	Yes	Not significant in region of comparison. Cultural and geology not found outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Cigar Creek	Yes	Not significant in region of comparison. Chukar not an outstandingly remarkable value.
Coyote Wash Watershed		
Coyote Creek	Yes	Not significant in region of comparison. Bighorn and pronghorn habitat not an outstandingly remarkable value, scenery and historic values not found outstanding, route not documented as historic. Not significant enough river value to make it eligible.
Blue Pools	No	Not significant in region of comparison. Historic water hole, but not outstanding.
Shittam Wash	Yes	Not significant in region of comparison. Habitat not an outstandingly remarkable value.
Croton Canyon Watershed		
Croton and Rogers Canyons	Yes	Not significant in region of comparison. Bighorn and chukar not outstandingly remarkable values, recreation and scenery not found to be outstanding. No information provided to support the segments as having at least one outstandingly remarkable value.
Navajo Canyon	Yes	Not significant in region of comparison. Bighorn and chukar not outstandingly remarkable values.
Willow Gulch	Yes	Not significant in region of comparison. Chukar not an outstandingly remarkable value.
Big Tank Draw	Yes	Not significant in region of comparison.
Basin Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Outstandingly remarkable values not significant in region of comparison. Chukar not an outstandingly remarkable value, recreation and geologic values not found to be outstanding.
Monday Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Bighorn not an outstandingly remarkable value.

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APPENDIX 4 - WILD AND SCENIC RIVER ELIGIBILITY

SEGMENT NAME	FREE FLOWING	WHY NOT ELIGIBLE
Sunday Canyon and Gates Draw	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Bighorn not an outstandingly remarkable value.
Little Valley Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Remote, little valley arch, but not outstanding, bighorn not an outstandingly remarkable value.
Mud Holes Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Rugged spot, not outstanding, bighorn not an outstandingly remarkable value, riparian and cultural values not found outstanding.
Blackburn Canyon	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Bighorn and chukar not outstandingly remarkable values, landslides and mass wasting fairly common in area.
Glen Canyon Watershed		
Dry Rock Creek	Partially	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Perennial water not an outstandingly remarkable value, bighorn, chukar, and wild horse not outstandingly remarkable values.
Lake Draw, Elbow Hollow and Tank Hollow	Yes	Not significant in region of comparison. Not much recreation, some cultural, but not outstanding, no information given to support scenic and recreation outstandingly remarkable values, perennial water not an outstandingly remarkable value.
Spencer Canyon	Yes	Not significant in region of comparison. Recreational, scenic and geological values not found to be outstanding. Bighorn and chukar not outstandingly remarkable values.
Rock Creek	Yes	Found to have scenic quality A in visual resource management criteria, but not found significant in region of comparison. Bighorn, chukar and perennial not outstandingly remarkable values.
Steer Canyon	Yes	Not significant in region of comparison. Bighorn not an outstandingly remarkable value.

Appendix 5

Wild and Scenic River Suitability

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APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

INTRODUCTION

As described in Appendix 4, representatives from Grand Staircase-Escalante National Monument, Bryce Canyon National Park, Glen Canyon National Recreation Area, and Dixie National Forest worked together to discuss suitability recommendations made in this document. Land managers responsible for managing the various segments came to consensus on segments which overlapped jurisdictions. They also made decisions for segments that were under their own jurisdictions. Due to differing agency mandates and stages in the study process, those segments lying within Grand Staircase-Escalante National Monument, as well as river segments found eligible between the Monument boundary and the Arizona state line, are assessed in this report. Glen Canyon National Recreation Area, Dixie National Forest, and Bryce National Park are currently working on suitability assessments for the segments within their jurisdiction.

Input was given by Kane County Water Conservancy District, the office of the Governor of Utah, Utah Division of Natural Resources, and Utah Division of Water Resources pursuant to the statewide Memorandum of Understanding (MOU) described in Appendix 3. All meetings held in regards to the MOU were open and announced to the public.

The suitability assessment is divided into two parts for Grand Staircase-Escalante National Monument. The first part assesses the Escalante River system, which includes the main stem of the Escalante River and many of its tributaries. The second part assesses the Paria River system and several of its tributaries. Alternative A (No Action) does not address suitability and leaves all segments eligible. Alternative C finds all eligible segments as non-suitable for designation as wild and scenic rivers. Alternative D finds all eligible segments suitable and Alternatives B and E find a portion of eligible segments as suitable, and a portion non-suitable for both river systems. Tentative classifications are the same for Alternatives B, D, and E, and were derived principally from the prescriptive zones described in the Monument plan. BLM's proposed action for suitability is addressed in Alternatives B and E.

Escalante River System

The Escalante River System begins on the Aquarius Plateau. The river system extends from the top of Boulder Mountain south into the Colorado River (Lake Powell). The river system lies within the Colorado Plateau Physiographic Province, Canyonlands, and Southern High Plateaus subprovinces. Dominant vegetation zones change with elevation and precipitation levels. Headwaters begin in the Montane Zone, which contains forests of ponderosa pine, douglas fir, englemann spruce, and blue spruce. The Piñon-Juniper Zone follows, blending eventually with the Sagebrush Zone, and ending in the lower Shadscale Zone. It flows through the Plateau Uplands water province and is in the Escalante River Drainage Basin.

Although the main stem of the Escalante begins northwest of the town of Escalante, most of the flow comes from its side tributaries such as Boulder Creek, Pine Creek, Death Hollow, Sand Creek, The Gulch, and Calf Creek. These tributaries are located downstream from the town of Escalante. Boulder Creek and Deer Creek flow through or near the town of Boulder.

The headwaters of the Escalante River are composed of several tributaries in the Escalante Ranger District of Dixie National Forest. From there, the river flows through the BLM-managed Grand Staircase-Escalante National Monument, and then enters Glen Canyon National Recreation Area. It ends at Coyote Gulch, near Lake Powell. The Escalante River System contains 213 river miles, 184.5 miles (or 87 percent) of which are on public lands managed by the Bureau of Land Management. This suitability assessment covers that portion of the river and its major tributaries within the boundaries of Grand Staircase-Escalante National Monument.

The Escalante River was first identified by the Departments of Interior and Agriculture as a candidate "inventory" river to be studied as a possible addition to the National Wild and Scenic River System on September 11, 1970. It was later identified as part of the nationwide rivers inventory by the National Park Service.

As prescribed in the Wild and Scenic Rivers Act and by BLM policy, the area included in this evaluation is the river area and its adjoining tributaries within the river corridor. Generally, the corridor width cannot exceed an average of 320 acres per mile, which is usually measured approximately 1/4 mile from the mean high-water mark on both sides of the channel. Few designated wild and scenic rivers have a boundary that is exactly 1/4 of a mile from the ordinary high water mark along their entire length. Corridor boundaries for Federally designated and administered wild and scenic rivers may vary based on a number of conditions, but are usually delineated by legally identifiable lines (survey or property lines). They may also be identified by some form of on-the-ground physical features (i.e., topography, natural or man-made features such as canyon rims, roads, etc.), which provide the basis for protecting the river's identified values and practicality in managing those values.

Alternatives Considered

About 213 miles of the Escalante River System would be considered suitable under Alternative D, and 140 miles would be considered suitable for Alternatives B and E for inclusion into the National Wild and Scenic Rivers System (NWSRS). All segments would remain eligible under Alternative A (No Action). All segments would be found non-suitable for Alternative C. Alternatives B and E represent BLM's proposed action for suitability.

The rationale for Alternative D is that the Escalante River would be a worthy addition to the NWSRS because it contains outstandingly remarkable river values that require special protective measures. This alternative focuses on remoteness; therefore, all the segments would be suitable. These outstandingly remarkable values are scenic, recreational, geological, fish and wildlife, cultural, historic, paleontological and riparian. Unique natural and human resources would benefit from the protection and enhancement afforded by National Wild and Scenic River designation.

The following segments have been recommended as non-suitable and would be released from further wild and scenic river consideration, subject to a change in existing conditions for Alternatives B and E: the upper part of Harris Wash, Dry Hollow Creek, Cottonwood Canyon, Blackwater Canyon, Lamanite Arch Canyon, Water Canyon, west fork of Steep Creek, Lower Horse Canyon, Wolverine Creek, Little Death Hollow, unnamed tributary west of Calf Creek, Phipps Wash and tributaries, and the upper part of Twentyfive Mile Wash and north tributary. The rationale for dropping these 13 eligible segments (78.7 miles) in Alternatives B and E is that while these segments have outstandingly remarkable values, BLM did not think them worthy to be included in a national river program in comparison with the river segments considered suitable in Alternatives D and E. Although most of the eligible segments have outstandingly remarkable scenic and recreational values, when considered in context with other resource values, alternative special management, and plan objectives, BLM could best manage the Escalante River system by concentrating greater management on those segments that contribute most to the riverine values, and less on those that do not.

In Alternative A, suitability would not be considered and all segments would remain eligible. This would mean protective management would remain in effect for all eligible segments. Protective management consists of a case-by-case review of proposed actions. It does not provide any pre-determined outcome, only that river values will be considered in evaluating proposed actions.

Table A5.1 describes each segment by tentative classification. It illustrates the differences between Alternatives D and Alternatives B and E.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

TABLE A5.1
DESCRIPTION OF SUITABLE RIVER SEGMENTS

RIVER SEGMENT	SEGMENT DESCRIPTION		LENGTH (MILES)		TENTATIVE CLASSIFICATION	OUTSTANDINGLY REMARKABLE VALUES
	Alternative D	Alternatives B, E	D	B, E		
Escalante Ri[illegible]	Confluence with Pine Creek (T35S, R3E, Sec. 9) to Highway 12 (T35S, R4E, Sec. 12)	Same	13.8	13.8	Wild	High scenic quality, high recreational use, numerous geologic features, important fish and wildlife habitat, prehistoric sites, historic homestead and roads, riparian area, fossil tracks, petrified wood
Escalante River-2	Highway 12 to east side of private land (T35S, R4E, Sec. 13)	Same	1.1	1.1	Recreational	
Escalante River-3	Private land to boundary (T36S, R6E, Sec. 4)	Same	19.2	19.2	Wild	
Harris Wash-1	Tenmile Crossing (T365S, R4E, Sec. 17) to confluence with Bighorn Wash (T36S, R4E, Sec. 15)	Not included	2.9	0.0	Scenic	High quality scenery, recreational attraction, access to National Recreation Area, southwestern willow flycatchers, historic road, prehistoric sites, scientific study opportunities
Harris Wash-2	Bighorn Wash to unnamed road (T36S, R5E, Sec. 33)	Not included	8.7	0.0	Wild	
Harris Wash-3	Road to west side state section (T36S, R5E, Sec. 36)	Not included	2.8	0.0	Recreational	
Harris Wash-4	T36S, R5E, Sec. 35 to Monument boundary (T36S, R5E, Sec. 36)	Same	1.2	1.2	Wild	
Lower Boulder Creek	Downstream side of state section (T34S, R4E, Sec. 11) to Escalante River (T35S, R5E, Sec. 22)	Same	13.6	13.6	Wild	High quality scenery, high recreational use, Escalante Canyons ONA, prehistoric sites
Dry Hollow Creek	Monument boundary (T34S, R4E, Sec. 3) to Lower Boulder Creek (T34S, R5E, Sec. 30)	Not included	4.3	0.0	Wild	High quality scenery

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

RIVER SEGMENT	SEGMENT DESCRIPTION		LENGTH (MILES)		TENTATIVE CLASSIFICATION	OUTSTANDINGLY REMARKABLE VALUES
	Alternative D	Alternative B, E	D	B, E		
Slickrock Canyon	Monument boundary (T33S, R5E, Sec. 22) to private land (T33S, R5E, Sec. 33)	Same	2.8	2.8	Wild	High quality scenery, recreational attraction, prehistoric sites, riparian areas
Cottonwood Canyon	Monument boundary (T33S, R5E, Sec. 22) to Lower Deer Creek (T34S, R5E, Sec. 4)	Not included	4.4	0.0	Wild	High quality scenery, high recreational attraction, cultural sites
Lower Deer Creek-1	Private land (T33S, R5E, Sec. 33) to Burr Trail Road (T34S, R5E, Sec. 16)	Same	3.8	3.8	Recreational	High quality scenery, Deer Creek Recreation Area, Escalante Canyons ONA, Southwestern willow flycatchers, prehistoric sites, threatened plant, riparian area
Lower Deer Creek-2	Burr Trail Road to Lower Boulder Creek (T33S, R5E, Sec. 9)	Same	7.0	7.0	Wild	
The Gulch-1	Monument boundary (T32S, R6E, Sec. 32)to Burr Trail Road (T34S, R5E, Sec. 13)	Same	11.0	11.0	Wild	High quality scenery, outstanding recreation, natural arch, peregrine habitat, Traditional Cultural Property, riparian area, petrified wood.
The Gulch-2	Along Burr Trail Road to T34S, R5E, Sec. 13	Same	0.6	0.6	Recreational	
The Gulch-3	Below Burr Trail Road to Escalante River (T35S, R5E, Sec. 36)	Same	13.0	13.0	Wild	
Blackwater Canyon	Entire (T34S, R5E, Sec. 23)	Not included	0.6	0.0	Wild	
Lamanite Arch Canyon	Monument boundary (T32S, R6E, Sec. 31) to The Gulch (T33S, R6E, Sec. 8)	Not included	2.4	0.0	Wild	
Water Canyon	Headwaters (T33S, R6E, Sec. 7) to FS boundary (T32S, R5E, Sec. 13); FS boundary to The Gulch (T33S, R6E, Sec. 30)	Not included	3.5	0.0	Wild	High quality scenery, outstanding recreation, natural arch, peregrine habitat, Traditional Cultural Property, riparian area, petrified wood.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

RIVER SEGMENT	SEGMENT DESCRIPTION		LENGTH (MILES)		TENTATIVE CLASSIFICATION	OUTSTANDINGLY REMARKABLE VALUES
	Alternative D	Alternatives B, E	D	B, E		
Steep Creek	Monument boundary (T33S, R5E, Sec. 24) to The Gulch (T34S, R5E, Sec. 12)	Same	8.9	8.9	Wild	High quality scenery, recreational attraction, riparian areas
Lower Horse Canyon	T35S, R6E, Sec. 29) to Escalante River (T35S, R6E, Sec. 32)	Not included	3	0.0	Wild	High quality scenery, ONA, high recreational use, international use, paleontology
Wolverine Creek	Entire (T34S, R7E, Sec. 20) to (T35S, R6E, Sec. 16)	Not included	9.7	0.0	Wild	High quality scenery
Little Death Hollow	Entire (T34S, R7E, Sec. 28) to (T35S, R6E, Sec. 28)	Not included	14.8	0.0	Wild	High quality scenery, recreational attraction
Lower Sand Creek and tributary Willow Patch Creek	Sweetwater Creek (T34S, R4E, Sec. 8) to Escalante River (T35S, R4E, Sec. 10)	Same	13.2	13.2	Wild	High scenic quality, ONA, fish habitat, Southwestern willow flycatcher, Historic trail, riparian area
Mamie Creek and west tributary	Monument Boundary (T34S, R3E, Sec. 16) to Escalante River (T35S, R4E, Sec. 7)	Same	9.2	9.2	Wild	High scenic quality, ONA, high recreational use, natural bridge, fish and wildlife habitat, prehistoric and historic sites, historic mail trail, riparian area
Death Hollow Creek	Monument boundary (T34S, R3E, Sec. 3) to Mamie Creek (T34S, R3E, Sec. 36)	Same	9.9	9.9	Wild	High scenic quality, ONA, Southwestern willow flycatcher, prehistoric sites, dinosaur tracks, riparian area
Calf Creek-1	Headwaters (T34S, R4E, Sec. 10) to Lower Calf Creek Falls (T34S, R3E, Sec. 24)	Same	3.5	3.5	Wild	High scenic quality, Calf Creek Recreation Area, bird habitat, prehistoric site, riparian
Calf Creek-2	Lower Falls to Calf Creek Recreation Site (T35S, R4E, Sec. 1)	Same	3	3	Scenic	High scenic quality, Calf Creek Recreation Area, bird habitat, prehistoric site, riparian
Calf Creek-3	Recreation Site to Escalante River (T35S, R4E, Sec. 12)	Same	1.5	1.5	Recreational	

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

RIVER SEGMENT	SEGMENT DESCRIPTION		LENGTH (MILES)		TENTATIVE CLASSIFICATION	OUTSTANDINGLY REMARKABLE VALUES
	Alternative D	Alternatives B, E	D	B, E		
Phipps Wash and tributaries	Headwaters (T35S, R4E, Sec. 22) to Escalante River (T35S, R5E, Sec. 18)	Not included	6	0.0	Wild	High quality scenery, recreational attraction
Unnamed tributary west of Calf Creek	Headwaters (T34S, R4E, Sec. 35) to Escalante River (T35S, R4E, Sec. 11)	Not included	2.6	0.0	Wild	High quality scenery, recreational attraction, geologic features, cultural sites
Twentyfive Mile Wash	Rat Seep Hollow (T37S, R5E, Sec. 25) to Monument boundary (T37S, R6E, Sec. 25), including unnamed tributary on north side	(37S, 6E, 29) to Monument boundary (37S, 6E, 25), does not include unnamed tributary on north side	9.1	6.8	Wild	High scenic quality, high recreational use, slot canyons, bird habitat, rock art, prehistoric structures and other sites from three cultures, riparian area

Note: Short segments of Scorpion Gulch, Fools Canyon, Coyote Gulch and Willow Gulch may be on Monument lands. These segments will be managed with the remainder of the named segments by Glen Canyon National Recreation Area.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

In addition to the outstandingly remarkable values listed in Table A5.1, the following factors (which are outlined in the Wild and Scenic Rivers Act) were analyzed for the Escalante River System as a whole. Specific facts and concerns pertaining to individual segments are presented in Table A5.2.

Characteristics which do or do not make the area a worthy addition to the National Wild and Scenic Rivers System: The segments identified in this report are on the Colorado Plateau Physiographic Province, Canyonlands and High Plateaus subprovinces. Currently, there are no designated components of the National Wild and Scenic Rivers System within this province. The Escalante River and Calf Creek Falls were specifically listed as objects of historic or scientific interest when the Monument was designated.

The Escalante River System is considered a worthy addition to the National Wild and Scenic River System based on the following outstandingly remarkable values:

- **Scenic** - Throughout the spectacular Escalante River system, rugged canyons, colorful outcroppings, and imposing cliff faces provide unique opportunities for sightseeing and photography. The river has carved a sheer-walled canyon that reaches depths of 1,100 feet.
- **Recreational** - The Escalante River and major tributaries provide outstanding opportunities for hiking, backpacking, boating, visiting cultural sites, photography and nature viewing. The canyons and colorful sandstone outcroppings, known as slickrock, attract visitors from throughout the U.S. and other countries. Water sources are plentiful in the Escalante Canyons, allowing easier travel. Canyons with similar geology are difficult to experience in other parts of the Colorado Plateau due to lack of water.
- **Geological** - Colorful canyon walls composed of layers of sandstone, siltstone, and limestone record the geologic past, including extensive sand dunes, invasions by seaways, and deposits made by broad river systems. Tens of thousands of years of weathering and erosion have resulted in the formation of numerous natural bridges and arches throughout the river corridor area. The canyons vary in width from a mile to only inches wide. These narrow canyons are commonly called slot canyons and number in the hundreds in this river system. Although these features are common to the Colorado Plateau, the number and variety of natural bridges, arches, and slot canyons make this area distinctive and exceptional.
- **Riparian** - The river segments provide unique riparian corridors through an otherwise arid region. A variety of wildlife species, both aquatic and terrestrial, rely upon the river for habitat. The riparian area contains occupied or suitable habitat for numerous sensitive or special status wildlife and plant species. The Escalante River System is home to the following documented wildlife groups: 8 amphibians, 190 birds, 54 mammals, 20 fishes, and 20 reptile species. Among these are the threatened and endangered southwestern willow flycatcher, peregrine falcon, Mexican spotted owl, and wintering bald eagles.
- **Historic** - The Escalante River system has provided water for humans in a relatively arid environment for at least 10,000 years. Prehistoric Native American Indian sites are prolific throughout the system. It continues to provide water for humans today.

Other values that support the addition of the Escalante River to the National Wild and Scenic Rivers System are significant paleontological values, including fossil trackways and petrified wood, and cultural sites that would be enhanced and protected by designation.

The Escalante River, Boulder Creek, Deer Creek, Sand Creek, Twentyfive Mile Wash, Calf Creek, The Gulch, Steep Creek, Coyote Gulch, Harris Wash, Mamie Creek and Death Hollow were included in *A Citizen's Proposal to Protect the Wild Rivers of Utah.*

Current Uses and Land Ownership Concerns:

- **Energy and Minerals:** There are 2 oil and gas leases within the river area near the confluence of Phipps Wash and the Escalante River (in T35S, R5E, Sec. 18), and an active lease on a small portion of Mamie Creek. There are no mining claims, mineral sites, or coal leases in the river area. Existing valid claims or leases within the river boundary remain in effect, and activities may be allowed subject to regulations that minimize surface disturbance, water sedimentation, pollution, and visual impairment. Reasonable access to mineral leases will be permitted.

- **Water Resource Developments, Water Rights and Instream Flow:** Existing water developments and rights held on the river area are associated with livestock, agricultural and domestic use. Ninety nine surface, 6 underground, and 8 spring water rights within 1 mile of each stream course in the Monument are on record with the State of Utah. Of these, BLM holds the rights to 40 surface, 0 underground, and 4 springs. Utah Division of Water Rights reports a total of 1.55 cfs surface diversions in the Escalante River, Calf Creek, Lower Deer Creek, and The Gulch. Most of the surface diversions are located on private land or on segments classified as Recreational. Wild and Scenic River designation would not affect these existing water rights as they are senior to any rights acquired through designation.

  There is some concern from local water conservancy districts and potential users over the possible effects designation could have on proposed or potential projects. This concern should be addressed by Congress upon Wild and Scenic River designation. No action taken in this plan or WSR recommendation can establish an appropriation or Federal reserved water right. A Congressional Act designating a WSR may or may not establish a Federal reserved water right. If Congress creates a reserved right, BLM or the State of Utah may establish instream flows necessary to meet the purposes of the designation.

The nature of such a condition would depend on the wording in the Act. Protective management for suitability could affect specific proposals if BLM would have to issue a right-of-way across BLM managed lands. At this time, there are no project proposals on suitable river segments.

- **Forestry, Agriculture and Livestock Grazing:** There are no forested lands within the study area. Agriculture in the form of irrigated farmlands occurs near the communities of Escalante and Boulder. These areas of agricultural use are not within the study area. However, farming has an impact on the river study area. Water is diverted out of the channels to irrigate the farmland and the runoff returns to the river bed. When this water returns, it can carry residues of agricultural chemicals, nutrients, and salts.

  Livestock grazing is permitted on public lands throughout the river area. There are 13 allotments in the study area. Grazing along the river and on the uplands is primarily a fall/winter/spring operation. The rivers provide a significant source of water in this area for livestock. Grazing would continue to be governed by applicable laws and regulations.

  Several fences cross the rivers within their corridors. These include allotment boundary fences, pasture fences, and state section line fences. If not removed after use, these wire fences typically wash out or are taken up during high flows but are rebuilt each year as flows recede or grazing operations start up for the season. Landowners and ranchers are concerned that they will not be able to maintain these fences with designation. W&SR designation would not affect the ability of landowners or ranchers to maintain fences.

- **Recreation Use and Facilities:** The Escalante River and major tributaries provide outstanding opportunities for recreational activities. These include hiking (canyoneering), backpacking, bird-watching, photography, viewing cultural sites, camping, and nature study. Recreational use is estimated to be 29,300 visits per year (based on 1997 RMIS data). Developed or semi-developed trail heads and trails are located at Calf Creek Lower and Upper Falls, Deer Creek, Escalante River outside of the town of Escalante, Highway 12, Harris Wash, and The Gulch.

  BLM operates Calf Creek Campground along Calf Creek, and Deer Creek Campground along Deer Creek. These sites received a total of 30,210 visits in FY 1997. Access to Calf Creek Falls, Deer Creek and other river-based activities is available at these sites.

- **Transportation/Utility Facilities:** Utah State Route 12 travels over the Escalante at the dividing point between segments 1 and 2. Along tributaries, dirt roads approach the water's edge and in some places, ford the river bed. An overhead utility line crosses over the river near State Route 12. Another line crosses Lower Sand Creek near its northern end. Wild and Scenic designation would not affect the ability to maintain these lines.

- **Private and Commercial Development:** Protective management for suitable segments only applies to BLM managed lands. Private and commercial development is not a concern for river management on public lands. There are 843 acres (2.6 miles) of private land within the river area.

Resources and uses that would be enhanced or curtailed by designation:

- **Scenic** - Approximately 198 river miles provide outstanding scenery in Alternative D and 173 miles in Alternatives B and E. Deep, narrow canyons, colorful rock walls, numerous interesting geologic features, and waterfalls provide exceptional opportunities for sightseeing and photography. During a BLM visual resources inventory, the river corridors were determined to have scenic quality A. This indicates that scenic qualities of the landforms, vegetation, and waterforms are extremely high, with great variety and distinction. Designation would ensure that the scenic values of this river system would not be impaired by additional water diversions or dams.

- **Recreational** - The Escalante River and major tributaries provide outstanding opportunities for hiking, backpacking, photography, and nature viewing. The canyons and colorful sandstone outcroppings, known as slickrock, attract visitors from throughout the U.S. and other countries. Canyons of the Escalante and its tributaries are well known for canyoneering (seeking out and hiking narrow slot canyons). Designation would enhance the recreation values for this river system by keeping the canyon system intact and desirable for hiking.

- **Geological** - The Colorado Plateau is a region of generally horizontal geologic strata where plateaus and mesas are separated by deep canyons. The meandering Escalante River has become deeply incised or entrenched into the Jurassic Navajo Sandstone in some places. Small side canyons within the 1/4 mile boundary to segments such as Little Death Hollow or the Escalante River are called slot canyons. Colorful canyon walls composed of layers of sandstone, siltstone, and limestone record times in the geologic past of extensive sand dunes, invasions by seaways, and deposits made by broad river systems. Tens of thousands of years of weathering and erosion have resulted in the forming of natural bridges and arches, water carved alcoves, rincons, and oxbows throughout the river area. Designation would ensure that our knowledge would be enhanced by providing an additional reason for scientific study.

- **Wildlife and Riparian Habitat** - The river and tributaries provide riparian corridors through an otherwise semi-arid region that support a wide variety of wildlife. As typical of wetland areas, the diversity of plants and wildlife around the washes and streams is greater than in the surrounding uplands. Various wildlife species rely upon the outstandingly remarkable riparian and wildlife habitat values of the river area for food, water and other requirements. The Escalante river supports a variety of fish species. Special status wildlife species include bald eagles, southwestern willow flycatcher, Mexican spotted owl and peregrine falcons. The riparian area is potential habitat for spotted bat, Townsend's big-eared bat, and golden eagle. Canyons of the Escalante could provide habitat for the recently reintroduced California condor. Other wildlife include bighorn sheep, mule deer, raccoons, bats, reptiles, amphibians, waterfowl, raptors, neotropical species, and other birds. Wild and Scenic River designation would ensure that habitat for these species would continue to be protected and would provide an additional reason to conduct scientific studies.

- **Vegetative Composition Varies Greatly Depending on the Zone:** Riparian and upland. Riparian communities associated with the river are composed largely of tamarisk stands with narrow corridors of native willows, ash, bulrushes, cattails, and cottonwoods. Mature cottonwood and willow galleries occur along the Escalante, and at scattered springs in tributaries. Stretches that receive disruptive, scouring floods on a regular basis may remain in a disclimax successional stage. Other vegetation includes rushes, sedges, and a variety of grasses and forbs. Algal mats are found in some quiet pools. Upland vegetation is described as a mixture of desert shrub, sagebrush, piñon-juniper, grasslands, mountain shrub, and coniferous woodlands. The distribution of these associations is determined largely by elevation and precipitation. Designation would enhance the viability of the riparian communities.
- **Cultural Resources** - There is evidence to suggest that cultural properties and features representing the entire time span of human occupation of the region are present along or immediately adjacent to the study area. This should not be surprising since water is a limiting factor to all human activity. The probable span of use of the riverine habitat covers from about 11,000 years before present to the most recent activities of our own time. Numerous prehistoric sites can be attributed to several Native American Indian cultures: Anasazi and Fremont, Hopi, Zuni, Paiute, and possibly Navajo. The riverine system continues to be important to modern societies. Cultural properties likely to be encountered along the river could include rock art sites, agricultural features, storage sites, rock shelters, habitations, artifact scatters, and pioneer-era homesteads, ranches, and travel routes. These cultural properties exhibit a challenge in balancing conservation and utilization, but also offer great opportunities for scientific study, education, and interpretation. Wild and Scenic River designation would enhance BLM's ability to further study these cultural resources.
- **Wilderness Study Areas** - 82 percent of the Escalante River and major tributaries run through Wilderness Study Areas (WSA) or Instant Study Areas (ISA). The river and/or tributaries flow through Phipps-Death Hollow ISA Complex, North Escalante Canyons/The Gulch ISA Complex, Escalante Canyons Tract 5 ISA Complex, Steep Creek WSA, and Scorpion WSA. There are no designated wilderness areas in the study area. Wild and Scenic River designation would complement BLM's management of the WSAs if classified as wild.
- **Streamflow and Water Quality** - The Escalante River and tributaries meet the definition of free-flowing. A mean flow of 11.4 cfs is recorded at the USGS gauging station located at the Escalante River/Pine Creek confluence and 22.5 cfs are recorded in Boulder Creek above the Escalante River. Data was collected from 1950-1955 which showed a mean flow of 82.2 cfs at the mouth. High flows typically occur during the spring runoff period and as a result of summer thundershowers. Scouring of the river beds as a result of high flows can affect channel morphology and riparian ecosystems.

  Utah Division of Water Quality has classified the Escalante River and tributaries from Lake Powell to the confluence with Boulder Creek as 2B, protected for secondary contact recreation (boating, wading), and 3C, protected for non-game fish and other aquatic life. The Escalante River and tributaries from the confluence of Boulder Creek to the headwaters and Deer Creek and tributaries, from confluence with Boulder Creek to headwaters are classified as 2B, protected for secondary contact recreation (boating, wading), 3A, protected for cold water fish and other cold-water aquatic life, and 4, protected for agricultural use.

  The Division of Water Quality defines anti-degradation segments as high quality waters with exceptional recreational or ecological significance or waters that require protection and are to be maintained at their existing quality. New point sources are prohibited and non-point sources shall be controlled to the extent feasible through best management practices. Calf Creek, Sand Creek, Mamie Creek, and Deer Creek are anti-degradation stream segments in the Monument. Wild and Scenic River designation would further protect streamflow and water quality.

Designation would not significantly restrict, foreclose, or curtail any activities currently occurring or proposed within the Escalante River System.

Federal, Public, State, Tribal, Local, or Other Interests

Garfield County was primarily concerned about the effect that W&SR designation would have on the proposal for Wide Hollow dam which is located above the suitable W&SR segments in all alternatives. The existing dam currently holds about 1,100 acre feet although it originally held 2,400 acre feet when it was built in 1956. The county is proposing a new location for the dam because the existing location has filled with sediments. The proposal calls for the new reservoir to hold 6,000 acre feet with water diverted from North Creek and Birch Creek to fill and maintain it. The existing dam also receives water diverted from these same streams. Wild and Scenic River designation may affect this project although additional environmental review would be needed to assess and mitigate the impacts.

Garfield County is also concerned that the segments immediately downstream from Hole-in-the-Rock Road would curtail the ability to improve that road. The upper part of Harris Wash, which is adjacent to the road, is not considered suitable for Alternatives B and E.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

Another concern expressed by Garfield County was for private landowners. It was suggested that BLM exclude these river segments from being suitable. Private landowners have .9 acres along the Escalante River upstream and downstream of the Highway 12 bridge, and own 1.7 miles along Deer Creek upstream of the Burr Trail. Wild and Scenic River designation does not affect private landowners and their senior water rights. Therefore, this is not a concern.

Escalante and Boulder are the only communities within the river area. It is anticipated that these communities would be most affected by possible designation of the river. Much of the economy of Escalante is dependent on agriculture and the scarce water supplies available. The viability of Escalante is dependent of the continuation of existing water diversions (Fremont and Noble). These diversions are upstream from the river study area.

Native American Indian tribes are concerned about rock art in the canyons. Wild and Scenic River designation would ensure that the rock art and surrounding area would remain intact.

Ability to Manage

The Escalante River system is considered to be manageable based on the current level and type of activities taking place, and adequate staff and funding is available to carry out management of a designated Wild and Scenic River. Designation of the Canyons of the Escalante may raise the level of management needed above that being proposed in the Monument Plan. Free-flowing character and outstandingly remarkable scenic, recreational, geological, and riparian values identified in the determination of eligibility can be protected through management actions. If the river segments are designated, a management plan would be developed within 3 years pursuant to the WSR Act to determine management objectives and strategy for long-term protection of the river's outstandingly remarkable values to the full extent of the WSRA.

About 87 percent of the river segments are on public land. River protection measures are being applied in environmental assessments of proposed projects and considered in all land use and activity plans.

All river segments are within Grand Staircase-Escalante National Monument. Almost half of the river mileage is in Outstanding Natural Areas which became Instant Study Areas in the wilderness study process. These other administrative designations including wilderness study areas would complement WSR designation and provide specific authority and guidance for BLM to protect and manage the rivers.

Historical or Existing Rights That Could be Adversely Affected by Designation

No impact on existing or historical rights would occur as a result of designation, although there is a perception that existing water rights could be adversely affected. Section 13 (b) of the Act states that jurisdiction over waters is determined by established principles of law. Existing, valid water rights are not affected by designation.

Alterations to existing irrigation or water withdrawal facilities may be approved under Section 7 of the Act as long as there is no direct adverse effect to the values for which the river was designated. The valid and existing rights of present land owners to use water and shorelines are not affected.

The Federal government may acquire water rights under state law. In some instances, the Federal government can purchase water from private citizens who have vested rights.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

TABLE A5.2
SUITABILITY SUMMARY FOR BLM'S PROPOSED ACTION

SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP, CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Harris Wash	• High quality scenery, recreational attraction, southwestern willow flycatcher habitat, historic road, prehistoric sites, scientific study opportunities are the characteristics that make the lower section a worthy addition to the WSR system. • The upper section was not chosen for the proposed action (Alternatives B and E) because the values identified, with the exception of the historic road, apply primarily to the lower section and the portion that flows through the NRA.	• 1.6 miles run through State lands which are being considered for exchange with BLM		• 1 mile Federal public water reserve • Garfield County concerned that W&SR designation would curtail improving Hole-in-the-Rock Road.	The cost to manage this 15.3 mile segment may exceed its contribution to the NWSR in Alternatives B and E.
Lower Boulder Creek	• High quality scenery, high recreational use, part of the Escalante Canyons ONA, prehistoric sites are the characteristics that make this a worthy addition to the WSR system.	• 3.4 miles run through State or other public lands • ½ mile runs through private ownership • A pipeline ROW exists along the north end T34S, R4E, Sec 11,12	• Fisheries could be enhanced with designation		
Dry Hollow Creek	• Scenery was the only outstandingly remarkable value identified for this segment. It also has a healthy riparian system. However, compared to other streams, this one does not contribute significantly to the Escalante River system for the proposed action (Alternatives B and E.)				The cost to manage this 4.2 mile segment may exceed its contribution to the NWSR in Alternatives B and E.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Lower Deer Creek	• High quality scenery, Deer Creek Recreation Area, Escalante Canyons ONA, southwestern willow flycatchers, prehistoric sites, threatened plant, and riparian area make this segment a worthy addition to the WSR system.	• 1.7 miles of the section of Deer Creek between Slickrock and the Burr Trail is on private land • Irrigation pipeline and right-of-way for maintenance of water system on part of pubic land • water right to approx 1.5 cfs for irrigation and non-consumptive use through this section • This is not a significant diversion for this stream.	• Fisheries could be enhanced with designation. • A Federally threatened species, the Ute ladies' tresses orchid, is found in the Deer Creek drainage and could be further protected by W&SR designation.	• Part of this segment is in the Escalante Canyons Outstanding Natural Area.	
Slickrock Canyon	• High quality scenery, recreational values, prehistoric sites, and riparian areas make this a worthy addition to the WSR system.				
Cottonwood Canyon	• Although this canyon exhibits high quality scenery and has recreational use, it is not deemed to be the best of the best.				The cost to manage this 4.4 mile segment may exceed its contribution to the NWSR in Alternatives B and E.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
The Gulch including Blackwater Canyon, Lamanite Arch Canyon, and Water Canyon	• Only The Gulch is deemed a worthy addition for the proposed action (Alternatives B and E). • High quality scenery, outstanding recreation, natural arch, peregrine habitat, Traditional Cultural Property, riparian area, petrified wood are the characteristics that make it worthy. • The other canyons are short, side tributaries whose outstandingly remarkable values are scenery, and a natural arch. They are not in and of themselves worthy additions to a national river system.	• 2 miles run through State lands		• Outstanding Natural Area	The cost to manage the 6.5 mile segment dropped in Alternatives B and E may exceed its contribution to the NWSR.
Steep Creek	• High quality scenery, recreational values, and riparian areas make this a worthy addition to the WSR system.				
Lower Horse Canyon	• Although this canyon exhibits high quality scenery, and has recreational use, the primary values do not contribute to its riverine values.		• While there is a diversion pipe at the top of this section, it has not been used in 15 years and there are not plans to utilize it in the future, therefore W&SR would not have no effect.	• Outstanding Natural Area	The cost to manage this 3.0 mile segment may exceed its contribution to the NWSR in Alternatives B and E.
Wolverine Creek	• Scenery was the only outstandingly remarkable value identified for this segment. • Compared to other streams, this one does not contribute significantly to the Escalante River system for the proposed action (Alternatives B and E).				The cost to manage this 9.7 mile segment may exceed its contribution to the NWSR in Alternatives B and E.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Little Death Hollow	• Scenery was the only outstandingly remarkable value identified for this segment. • Compared to other [illegible] area, this one does not contribute significantly to the Escalante River system for the proposed action.			• Outstanding Natural Area	The cost to manage this 14.8 mile segment may exceed its contribution to the NWSR in Alternatives B and E.
Escalante River	• High scenic quality, high recreational use, numerous geologic features, important fish and wildlife habitat, prehistoric sites, historic homestead and roads, riparian area, fossil tracks, petrified wood make this a worthy addition to the national system.	• 2 power lines, 1 pipeline, and 1 telephone line cross the Escalante River and Calf Creek near their confluence, T35S, R4E, Sec 12. • There is also a ROW for State Route 12 near Escalante River and Calf Creek confluence.		• Garfield County is concerned about their ability to replace Wide Hollow Reservoir upstream of this segment.	
Lower Sand Creek and Willow Patch Creek	• High scenic quality, part of an ONA, fish habitat, southwestern willow flycatcher habitat, historic trail, and riparian area make this river segment a worthy addition.	• A utility line crosses the north end of Lower Sand Creek, T34S, R4W, Sec 8.			
Mamie Creek and West Tributary	• High scenic quality, part of an ONA, high recreational use, natural bridge, fish and wildlife habitat, prehistoric and historic sites including an historic mail trail, and riparian area make this a worthy addition.			• Part of Phipps Death Hollow Outstanding Natural Area	

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Unnamed tributary (west of Calf Creek, top to Escalante River)	• Scenery and recreation were the outstandingly remarkable values identified for this segment. • Compared to other streams, this one does not contribute significantly to the Escalante River system.			• North Escalante Canyons Outstanding Natural Area	The cost to manage this 2.6 mile segment may exceed its contribution to the NWSR in Alternatives B and E.
Death Hollow Creek	• High scenic quality, part of an ONA, southwestern willow flycatcher habitat, prehistoric sites, dinosaur tracks, and riparian area make this a worthy addition to the system.			• This segment is in the North Escalante Canyons Outstanding Natural Area	
Calf Creek	• High scenic quality, Calf Creek Recreation Area, bird habitat, prehistoric site, and riparian area make this a worthy addition to the WSR system.	• Public campground • diversion on lower end • 2 power lines, 1 pipeline, and 1 telephone line cross the Escalante River and Calf Creek near their confluence, T35S, R4E, Sec 12. There is also a ROW for State Route 12 near Escalante River and Calf Creek confluence.	• Recreation could be enhanced	• This segment is in an Outstanding Natural Area • and a Recreation Area	
Phipps Wash and tributaries	• Scenery and recreation were the outstandingly remarkable values identified for this segment. • Compared to other streams, this one does not contribute significantly to the Escalante River system.				The cost to manage this 6 mile segment may exceed its contribution to the NWSR in Alternatives B and E.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Twentyfive Mile Wash #2 and North tributary	• The lower section was chosen for the proposed action (Alternatives B and E) because the values identified apply primarily to the lower section and the portion that flows through the NRA. • The values are high scenic quality, high recreation use, bird habitat, rock art, prehistoric structures, and riparian.			• Outstanding Natural Area	The cost to manage the 4.4 mile segment dropped in Alternatives B and E may exceed its contribution to the NWSR.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

Paria River System

The Paria River System begins on the Paunsaugunt Plateau near Bryce Canyon. The river system flows through the White Cliffs and the Vermilion Cliffs, and carves its way through the Paria Canyon/Vermilion Cliffs Wilderness Area to the Colorado River. The Paria River and tributaries are in the Colorado Plateau Physiographic Province and in the Canyonlands and High Plateaus subprovinces. Dominant vegetation zones change with elevation and precipitation levels. These zones start in lower elevations with Shadscale, then blend with Sagebrush, and eventually Piñon-Juniper zones. Headwaters of some tributaries are in the Montane Zone. The Paria is a significant tributary in the Colorado River Basin and joins the Colorado at Lees Ferry in Arizona. It flows through the Plateau Uplands water province.

The headwaters of the Paria River are composed of several tributaries in Dixie National Forest and Bryce Canyon National Park. From there, the Paria flows through the BLM-managed Grand Staircase-Escalante National Monument and then leaves the study area at the Arizona State line. The Paria River System studied in this document covers 117.5 river miles, of which 101.6 miles (86 percent) are on public lands managed by the Bureau of Land Management. This suitability assessment covers the river and major tributaries within the boundaries of the Monument, as well as designated BLM wilderness outside the Monument boundaries.

As prescribed in the WSR Act and by BLM policy, the area included in this evaluation is the river area and its adjoining tributaries within the river corridor. Generally, the corridor width cannot exceed an average of 320 acres per mile, which is usually measured approximately 1/4 mile from the mean high-water mark on both sides of the channel. Few designated WSRs have a boundary that is exactly one-quarter of a mile from the ordinary high water mark along their entire length. Corridor boundaries for Federally designated and administered WSRs may vary based on a number of conditions, but are usually delineated by legally identifiable lines (survey or property lines). They can also be delineated by some form of on-the-ground physical features (i.e., topography, natural or man-made features such as canyon rims, roads, etc.), which provide the basis for protecting the river's identified values and practicality in managing those values.

Alternatives Considered

About 213 miles of the Escalante River System would be considered suitable under Alternative D, and 140 miles would be considered suitable for Alternatives B and E for inclusion into the National Wild and Scenic Rivers System (NWSRS). All segments would remain eligible under Alternative A (No Action). All segments would be found non-suitable for Alternative C. Alternatives B and E represent BLM's proposed action for suitability

About 116 miles of the Paria River System would be considered suitable under Alternative D, and 110 miles would be considered suitable for Alternatives B and E for inclusion into the National Wild and Scenic Rivers System. All segments would remain eligible under Alternative A (No Action). All segments would be found non-suitable for Alternative C. Alternatives B and E represent BLM's proposed action for suitability. The classifications recommended for the segments are indicated in Table A5.3.

The rationale for this recommendation is that the Paria River and selected tributaries would be worthy additions to the WSR system because they contain outstandingly remarkable river values that require special protective measures. These values are scenic, recreational, wildlife, geological and historic. Unique natural and human resources would benefit from the protection and enhancement afforded by National Wild and Scenic River designation.

While the segments identified for Alternatives B and E contain some of the above values, Bull Valley Gorge would not be included for Alternatives B and E. The rationale for dropping this 5.9 mile segment is that while this segment has high quality scenery, is a recreational attraction, and has a confirmed Mexican spotted owl, the watershed for this tributary is small and the outstandingly remarkable values are derived from its geology rather than being a riverine system. The recreation interest lies in the tributary as a slot canyon.

Threats to the Paria River or tributaries within the study area could come from diverting or impounding water for use or modifying stream channels. However, there are no major developments or actions being proposed that would significantly alter the river system's values.

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APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

TABLE A5.3
DESCRIPTION OF SUITABLE RIVER SEGMENTS

RIVER SEGMENT NAME	SEGMENT DESCRIPTION		LENGTH		TENTATIVE CLASSIFICATION	OUTSTANDINGLY REMARKABLE VALUES
	Alternative D	B,E	D	B,E		
Upper Paria River - 1	Little Dry Valley (T38S, R2W, Sec 21) to T41S, R1W, Sec 7	Same	22.0	22.0	Wild	High quality scenery, recreational values, exposed geologic strata and arch, historic sites
Upper Paria River - 2	T41S, R1W, Sec 7 to downstream side of private property south of Highway 89 (T42S, R1W, Sec 28)	Same	16.9	16.9	Recreational	
Lower Paria River-1	Downstream side of private property (T43S, R1W, Sec. 10) to wilderness boundary (T43S, R1W, Sec. 23)	Same	3.3	3.3	Recreational	High quality scenery, wilderness area, high recreation use, narrow canyon
Lower Paria River-2	Segment in wilderness (T43S, R1W, Sec. 23 to T44S, R1W, Sec. 1[illegible]	Same	4.8	4.8	Wild	
Deer Creek Canyon	Headwaters (T40S, R3W, Sec. 1) to Paria River (T40S, R2W, Sec. 4)	Same	5.1	5.1	Wild	High quality scenery, recreational values
Snake Creek	Entire (T39S, R2W, Sec. 26 to T40S, R2W, Sec. 10)	Same	4.7	4.7	Wild	High quality scenery, recreational values
Hogeye Creek	Entire (T40S, R2W, Sec. 1 to T40S, R2W, Sec. 26)	Same	6.3	6.3	Wild	High quality scenery, recreational values
Kitchen Canyon	T40S, R2W, Sec. 28 to Starlight Canyon (T40S, R2W, Sec. 34)	Same	1.2	1.2	Wild	High quality scenery
Starlight Canyon	Entire (T41S, R2W, Sec. 7 to T40S, R2W, Sec. 35)	Same	4.9	4.9	Wild	High quality scenery
Bull Valley Gorge	Little Bull Valley (T38S, R3W, Sec. 28) to Sheep Creek (T39S, R2W, Sec. 7)	Not included	5.9	0.0	Wild	High quality scenery, recreational values related to slot canyon, spotted owls
Lower Sheep Creek	Bull Valley Gorge (T39S, R2W, Sec. 7) to Paria River (T39S, R2W, Sec. 17)	Same	1.5	1.5	Wild	High quality scenery, recreational values, spotted owls

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

RIVER SEGMENT NAME	SEGMENT DESCRIPTION		LENGTH		TENTATIVE CLASSIFICATION	OUTSTANDINGLY REMARKABLE VALUES
	Alternative D	B,E	D	B,E		
Hackberry Creek	Top (T38S, R1W, Sec. 29) to Cottonwood Creek	Same	20.0	20.0	Wild	Recreational values, spotted owls, riparian area
Lower Cottonwood Creek	Confluence with Hackberry Creek to Paria River	Same	2.9	2.9	Recreational	Recreational values
Buckskin Gulch	Wilderness boundary (T43S, R2W, Sec. 15) to Paria River (T44S, R1W, Sec. 12)	Same	18.0	18.0	Wild	High quality scenery, high recreational use, slot canyons

In addition to the outstandingly remarkable values listed in Table A5.3, the following factors were analyzed generally for the Paria River System as a whole. Additional specific facts and concerns are addressed in Table A5.4.

Characteristics Which do or do not Make the Area a Worthy Addition to NWSRS

The segments identified in this report are in the Colorado Plateau Physiographic Province, Canyonlands and High Plateaus subprovinces. Currently, there are no designated components of the NWSRS within this province. The Nationwide Rivers Inventory identified the Paria River from Colorado River to its source as possessing values of national significance as identified by the NPS (National Park Service, 1982, 1986, 1988). The Paria was listed as an object of historic or scientific interest when the Monument was designated.

The adjacent Arizona Strip District identified the segment of the Paria River within designated wilderness (in Utah) and it was determined suitable. This determination (although in the administrative record) was not included in the Arizona statewide W&SR review in 1994 -1996.

The Paria River, Hackberry Creek and Bull Valley Gorge were nominated as eligible rivers in *A Citizen's Proposal to Protect the Wild Rivers of Utah*.

The Paria River system would be a worthy addition to the National Wild and Scenic River System based on the following outstandingly remarkable values:

- **Scenic** - Throughout the spectacular Paria River Gorge, rugged canyons, colorful outcroppings and imposing cliff faces provide unique opportunities for sightseeing and photography.
- **Recreational** - The Paria River and major tributaries provide outstanding opportunities for hiking, backpacking, photography, and nature viewing. The canyons and colorful sandstone outcroppings, know as slickrock, attract visitors from throughout the U.S. and other countries.
- **Geologic** - The Paria River cuts through strata of successively older rocks ranging in age from Cretaceous through Permian, a time span of more than 150 million years, as it descends toward the Colorado River. The Paria River tributary of Lower Sheep Creek and Bull Valley Gorge, which flows into Sheep Creek, are narrow canyons incised mostly into Jurassic Navajo Sandstone.
- **Riparian** - The river provides a unique riparian corridor through an otherwise arid region. This corridor provides habitat for 329 species of wildlife: 7 amphibians, 242 birds, 59 mammals and 21 reptiles. Among these are the threatened and endangered southwestern willow flycatcher, peregrine falcon, Mexican spotted owl, and wintering bald eagles. There are documented nests in the riparian vegetation along the banks of the Paria. This is also an important historic habitat for the population of reintroduced bighorn sheep.
- **Historic** - The Paria River system has provided water for humans in a relatively arid environment for at least 10,000 years. Prehistoric Native American Indian sites are prolific throughout the system. The river system continues to provide water for humans today.

Other values that support addition of the Paria to the NWSRS are significant paleontological values, including fossil trackways and petrified wood, and cultural sites that would be enhanced and protected by designation.

Current Uses and Land Ownership Concerns

- **Energy and Minerals:** An existing oil and gas lease is within the river area on the north end of Hackberry Creek. There are no oil or gas wells within the river area. There are no mining claims. All Federal lands in the Monument are withdrawn from new mineral entry. Existing valid claims or leases within the river boundary remain in effect, and activities may be allowed, subject to regulations that minimize surface disturbance, water sedimentation, pollution, and visual impairment. Reasonable access to mining claims and mineral leases will be permitted. Mining claims, subject to valid existing rights, can be patented only as to the mineral estate and not the surface estate, subject to proof of discovery prior to the effective date of designation.
- **Water Resource Developments, Water Rights and Instream Flow:** Existing water developments and rights within the river area are associated with livestock, agricultural, and domestic use. Sixty four surface, 6 underground, and 7 spring water rights within the river corridor are on record with the State of Utah. Of these, BLM holds the rights to 31 surface, 2 underground, and 7 springs. Utah Division of Water Resources reports a total of 3.14 cfs surface diversions in Buckskin Gulch, Hackberry Creek, Hogeye Creek, Lower Paria River, and the Upper Paria River. Three of these cfs are held by private landowners primarily on the upper Paria, with some on the lower Paria. Existing, valid water rights would not be affected by designation. Future water developments on or above public land segments would be subject to environmental analysis where Federal permits, approval, or funding would be involved.

  There is some concern from Kane County Water Conservancy Districts and potential users over the possible effects designation could have on proposed or potential projects. This concern should be addressed by Congress upon Wild and Scenic River designation. No action taken in this plan or WSR recommendation can establish an appropriation or Federal reserved water right. A Congressional Act designating a WSR may or may not establish a federal reserved water right. If Congress creates a reserved right, BLM or the State of Utah may establish instream flows necessary to meet the purposes of the designation. The nature of such a condition would depend on the wording in the Act. Protective management for suitability could affect specific proposals if BLM would have to issue a right-of-way across BLM managed lands. At this time, there are no project proposals on suitable river segments.

- **Forestry, Agriculture and Livestock Grazing:** There are no forested lands within the study area. Agriculture, in the form of irrigated farmlands, occurs near the communities of Tropic, Cannonville, and Adairville. These areas of agricultural use are not within the study area. However, the farming has a major impact on the river study area. Water is diverted out of the channels to irrigate the farmland and the runoff returns to the river bed. When this water returns, it can be carrying remnants of chemicals used to spray the fields.

  Livestock grazing is permitted on public lands throughout the river area. The Paria and tributaries flow through 7 allotments and serve as boundaries for others. The Paria flows through Bunting Well, Cottonwood, and Headwaters Allotments. Grazing along the river and on the uplands is primarily a fall/winter/spring operation. The river is the major source of water in this area for livestock. Grazing would continue to be governed by applicable laws and regulations.

  Six fences cross the Paria within the corridor. These include allotment boundary fences, pasture fences, and state section line fences. If not removed after use, these wire fences typically wash out or are taken up during high flows, but are rebuilt each year as flows recede or grazing operations start up. Landowners are concerned that they will not be able to maintain these fences with designation. W&SR designation would not affect the ability of landowners or ranchers to maintain fences.

- **Recreational Use and Facilities:** Corridors of the Paria River and tributaries provide outstanding opportunities for recreational activities. These include hiking (canyoneering), backpacking, bird-watching, photography, camping, and nature study. Recreational use is estimated to be about 7,200 visits per year (based on 1997 RMIS data).

  BLM has developed trailheads at Whitehouse, Buckskin Gulch, and Wire Pass. These sites receive most of the Paria visitors (6,986 in FY 1997). Access for hiking and river-based activities is available at these trailheads. A visitor contact station and developed campground are located near the Whitehouse trailhead. The old Pahreah townsite and Paria Movie Set are located near the river corridor north of Highway 89.

- **Transportation/Utility Facilities:** U.S. Highway 89 travels over the river at the lower end of the Upper Paria. Outside of wilderness, dirt roads approach the water's edge, and in some places, ford the river. An historic travel route that is still in use today goes along the Upper Paria river channel, in and out of the river. Power transmission lines cross over the river at three places between the Pahreah townsite and Highway 89, and two others cross the Paria at the wilderness boundary. Wild and Scenic designation would not affect the ability to maintain these lines.

- **Private and Commercial Development:** Interim management strategy for the Monument is to locate all major developments outside the Monument boundaries. There are 1,152 acres (5 miles) of private land within the river area. Development on these parcels is not a concern for river management.

- **Rights-of-Way, Leases or Traditional Uses:** Three rights-of-way fall within the Paria River study area. They are for utility lines at T41S, R1W, Sec. 29 and 32; T42S, R1W, Sec. 16; and T43S, R1W, Sec. 23.

Resources and Uses that Would be Enhanced or Curtailed by Designation

- **Scenic** - The inventory indicates that 83 river miles possess outstanding scenic values in Alternative A and 78 miles in Alternatives B and E. Deep, narrow canyons and colorful rock walls provide exceptional opportunities for sightseeing and photography. During a BLM visual resources inventory, the river corridors were determined to have scenic quality A. This indicates that scenic qualities of the landforms, vegetation, and waterform are extremely high, with great variety and distinction. Designation would ensure that the scenic values of this river system would not be impaired by additional water diversions or dams.

- **Recreation** - The Paria River and major tributaries provide outstanding opportunities for hiking, backpacking, photography, and nature viewing. The canyons and colorful sandstone outcroppings, known as slickrock, attract visitors from throughout the U.S. and other countries. Thousands of hikers and backpackers a year visit the river as it flows through the Paria Canyon/Vermilion Cliffs Wilderness Area. Outside the wilderness area, visitor use is quite low and dispersed. Designation would enhance the recreation values for this river system by keeping the canyon system intact and desirable for hiking.

  The Paria River Corridor is also accessed by motorized users. This use would be curtailed for the entire river corridor in Alternatives B and D by the zone prescriptions. W&SR classifications support the zone prescriptions. Alternative E would allow motorized use in the Paria Box, the section of river below the old Paria townsite.

- **Geological** - The Colorado Plateau is a region of generally horizontal geologic strata where plateaus and mesas are separated by deep canyons. The Paria River cuts through strata of successively older rocks ranging in age from Cretaceous through Permian, a time span of more than 150 million years, as it descends toward the Colorado River near Lee's Ferry. The upper reaches of the Paria include the tributaries of Bull Valley Gorge and Lower Sheep Creek. These slot canyons, so defined because they are very deep with extremely narrow walls, are incised mostly into the Jurassic Navajo Sandstone. Southern portions of the Paria River and tributaries such as Buckskin Gulch, also form slot canyons. Kaibab Gulch, the upper reaches of Buckskin Gulch, is the stratigraphic type section for the Permian Kaibab Formation. Designation would ensure that knowledge would be enhanced by providing a basis for additional scientific study.

- **Riparian and Wildlife Habitat** - The river and tributaries provide riparian corridors through an otherwise semi-arid region that support a wide variety of wildlife. As typical of wetland areas, the diversity of plants and wildlife around the washes and streams is greater than in the surrounding uplands. Various wildlife species rely upon the river area for consumptive use and other requirements. Special status wildlife species include bald eagles, southwestern willow flycatcher, Mexican spotted owl, and peregrine falcons. The riparian area is potential habitat for the recently reintroduced California condor. Other wildlife include bighorn sheep, mule deer, raccoons, bats, reptiles, amphibians, waterfowl, raptors and other birds (see Appendix 7 for a species list). Wild and Scenic River designation would ensure that habitat for these species would continue to be protected, and would provide an additional reason to conduct scientific studies.

- **Vegetative Composition Varies Depending on the Zone:** Riparian and Upland. Riparian communities associated with the river consist of native willows, cottonwoods, bulrushes, cattails, and non-native tamarisk. Stretches that receive disruptive, scouring floods on a regular basis remain in a disclimax successional stage. Other vegetation includes rushes, sedges, and a variety of grasses and forbs. Algal mats are found in some quiet pools. Upland vegetation is described as a mixture of desert shrub, sagebrush, piñon-juniper, grasslands, mountain shrub and coniferous woodlands. The distribution of these associations is determined largely by elevation and precipitation. Designation would enhance the viability of the riparian communities.
- **Cultural (Prehistoric and Historic) Resources** - There is evidence to suggest that cultural properties and features representing the entire time span of human occupation of the region are present along or immediately adjacent to the Paria River. This should not be surprising since water is a limiting factor to all human activity. The probable span of use of the riverine habitat covers from about 11,000 years before present to the most recent activities of our own time. Numerous prehistoric sites can be attributed to several Native American cultures: Anasazi and Fremont, Hopi, Zuni, Paiute, and possibly Navajo. The river system continues to be important to modern societies. Cultural properties likely to be encountered along the river include rock art sites, agricultural features, storage cists, rock shelters, habitations, artifact scatters and pioneer-era homesteads, ranches, and travel routes. These cultural properties exhibit a challenge in balancing conservation and utilization, but also offer great opportunities for scientific study, public education and interpretation.
- **Wilderness and Wilderness Study Areas** - 77 percent of the Paria River and tributaries run through wilderness study areas (WSA) and a designated wilderness in Alternative A, and 75 percent in Alternatives B and E. The river and tributaries flow through the Paria-Hackberry WSA and The Cockscomb WSA. Lower Paria River-2 segment and the entire eligible segments of Buckskin Gulch and Wire Pass are within the Paria Canyon/Vermilion Cliffs Wilderness Area (23 miles or 19 percent). Wild and Scenic River designation would complement BLM's management of Wilderness and WSAs.
- **Streamflow and Water Quality** - The Paria River and tributaries are free-flowing streams although intermittent. A mean flow of 9.08 cfs is recorded by USGS south of the town of Tropic. High flows typically occur during the spring runoff period and as a result of summer thundershowers. Frequent scouring of the river as a result of high flows constantly affects channel morphology and the stage of riparian ecosystems.

  Utah Division of Water Quality has classified the Paria River and tributaries from the State line to headwaters as 2B, protected for secondary contact recreation (boating, wading), 3A, protected for cold water fish and other cold-water aquatic life, and 4, protected for agricultural use.

  The Paria generally is turbid and saline. The water appears turbid for most of the year to the degree that the substrate is not visible. Dissolved salt and sediment loads are high, reducing the feasibility and success of impoundments on the river. There is heavy algal growth in pools during periods of low water. River designation would further protect streamflow.

Federal, Public, State, Tribal, Local, or Other Interests

Kane County Water Conservancy District does not support Wild and Scenic River designation for the Paria River System. They are specifically concerned about being able to maintain the power lines on the lower portion of the Paria River and upgrading the crossing on Skutumpah road over Bull Valley Gorge. Bull Valley Gorge is determined suitable in Alternative D. However, Wild and Scenic River designation may or may not affect the county's ability to improve the crossing over the canyon, dependent on an individual site specific assessment of impacts. This is not a concern for Alternatives B and E, as Bull Valley Gorge is not considered suitable. Power lines would be able to be maintained under both of these alternatives.

Kane County Water Conservancy District also expressed concern for the private property owners near Highway 89. They feel that those private property owners will not be able to use their water rights if designation occurs. They are also concerned that ranchers will not be able to repair and build fences in the river corridor. Wild and Scenic River designation does not affect private landowners and their senior water rights. Therefore, this is not a concern.

There was also concern that motorized users will not be able to access the Paria River Corridor as they have in the past. Motorized and mechanized use would be curtailed by Alternatives B, C, and D in the Monument Management Plan. Alternative E would allow for motorized access in the Paria Box and below to the Wilderness boundary. In Alternative A, BLM would continue to manage the segments as eligible, and the classification for the Paria segment would be recreational allowing motorized use. Wild and Scenic designation would support motorized restrictions in Alternatives B, D, and E, which would curtail motorized use.

Native American Indian tribes are concerned about rock art in the canyons. Wild and Scenic River designation would ensure that the rock art and surrounding area would remain intact.

Ability to Manage

The Paria River study area is considered to be manageable based on the current level and type of activities taking place, and assuming that adequate staff and funding is available to carry out management of a designated Wild and Scenic River. Designation of the Paria River System would slightly raise the level of management needed above that being proposed in the Monument plan. Free-flowing character and outstandingly remarkable scenic, recreational, geological, and riparian values identified in the eligibility study can be protected through management actions. If the rivers are designated, a management plan would develop management objectives and strategy for long-term protection of the river's outstandingly remarkable values to the full extent of the WSRA.

Eighty-six percent of the segments are on public lands. Protective management has been in effect since eligibility was determined, as outlined in BLM Manual Section 8351. River protection is considered in environmental assessments of proposed projects and in all land use and activity plans.

Twenty percent of the river system is in a designated wilderness area. The majority of the remainder on public land is in wilderness study areas. Dams could be constructed in wilderness but not on NWSRs. Overlapping designations complement WSR designation and provide additional authority, protection, and guidance for BLM to manage the river if designated.

Historical or Existing Rights that Could be Adversely Affected by Designation

No impact on existing or historical rights would occur as a result of designation.

APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

TABLE A5.4
SUITABILITY SUMMARY FOR BLM'S PROPOSED ACTION

RIVER SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY DESIGNATION	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Upper Paria River	• High quality scenery, recreational attraction, exposed geologic strata and arches, and historic sites make this area a worthy addition.	• The Paria River runs through 3.1 miles of private lands in the Recreation segment. • The landowner in the lower segment periodically constructs a diversion utilizing their water rights. While this blocks the flow temporarily, the diversion is frequently washed out by high flows retaining the free-flowing character of the Paria River. • 3.9 miles run through State lands. • There is motorized use and commercial horseback rides in the river corridor. It is used as a livestock driveway and historic thoroughway.	• Motorized use would be curtailed if designated Wild • Enhance southwestern willow flycatcher habitat • Enhance deer population and all other wildlife if no OHV use allowed.	• Kane County Water Conservancy District is concerned that private property owners will be constrained from using their water rights or building fences. • They also are concerned that ranchers will not be able to drive their cattle down the Paria like they do now. • They are also concerned that the existing power lines could not be maintained if designated.	
Lower Paria River	• High quality scenery, wilderness area, high recreation use, narrow canyon, peregrine, and historic travelway make this a worthy addition.		• Habitat for peregrine and southwestern willow flycatcher would be enhanced	• 4.9 miles is in the designated Paria-Vermilion Cliffs Wilderness area outside Grand Staircase-Escalante National Monument boundaries	
Deer Creek Canyon	• High quality scenery and recreation values make this a worthy addition.	• 3.1 miles run through state lands.			
Snake Creek	• High quality scenery and recreation values make this a worthy addition.				
Hogeye Creek	• High quality scenery and recreation values make this a worthy addition.				

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APPENDIX 5 - WILD AND SCENIC RIVER SUITABILITY

RIVER SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY DESIGNATION	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Kitchen Canyon	• High quality scenery makes this a worthy addition to the system.				
Starlight Canyon	• High quality scenery makes this a worthy addition to the system.	• .2 miles run through State lands.			
Bull Valley Gorge	• High quality scenery, recreational values, slot canyon, spotted owls are characteristics that make this a worthy addition for Alternative D. The values are more the result of the geologic process than the hydrologic process, however. • The spotted owl would be protected under the GSENM plan. Therefore, it is not considered worthy in Alternatives B and E because the canyon would be protected under Monument values.	• A makeshift bridge on the Skutumpah Road spans Bull Valley Gorge.		• Kane County is concerned that they will not be able to improve the road or bridge that spans the gorge due to WSR designation.	
Lower Sheep Creek	• High quality scenery, recreational values, a known spotted owl sighting make this a worthy addition to the WSR system.	• Motorized use • Livestock driveway • Historic throughway	• Motorized use would be curtailed if classified Wild		
Hackberry Creek	• Recreational and scenic values, spotted owls, and riparian area make this a worthy addition to the system.	• 3.1 miles run through state lands. • Limited OHV use at upper and lower ends	• Motorized access would be curtailed if classified as Wild		
Lower Cottonwood Creek	• Recreational values and ecologic continuity make this a worthy addition to the system.	• 1.3 miles run through private lands.			

RIVER SEGMENT NAME	CHARACTERISTICS WHICH DO OR DO NOT MAKE THE AREA A WORTHY ADDITION TO WSR SYSTEM.	CURRENT USES AND LAND OWNERSHIP CONCERNS	RESOURCES AND USES THAT WOULD BE ENHANCED OR CURTAILED BY DESIGNATION	FEDERAL, PUBLIC, STATE, TRIBAL, LOCAL, OR OTHER INTERESTS	ABILITY TO MANAGE
Buckskin Gulch and Wire Pass	• High quality scenery, wilderness area, high recreational use, slot canyons, and known peregrine make this a worthy addition to the WSR system.	• .2 miles run through state lands. • There is a lone watering hole in this segment used for livestock. • Motorized vehicles are used to maintain range improvements.	• Spring and vegetation could be enhanced	• These segments are in the designated Paria-Vermilion Cliffs Wilderness area outside GSENM boundaries	

Estimated Cost

No additional easements or land acquisitions are anticipated as a result of NWSR designation. Section 6(b) of the National Wild and Scenic Rivers Act specifically prohibits the use of condemnation for fee title purchase of lands if 50 percent or more of the acreage within the river area boundary is in public ownership (Federal, state or local government). This is the case with both the Escalante and Paria River Systems. It is estimated that an additional $70,000 or 1 FTE would be needed to develop, implement, and maintain actions identified in the river plans.

Interim Management

Until a record of decision by the BLM determines segments non-suitable, and/or Congressional action on any recommendations for those segments be included as a part of the National Wild and Scenic River System, all eligible river areas on Federal lands are under management to protect their free-flowing characteristics, tentative classifications, and outstandingly remarkable values. This means that values which make rivers eligible for inclusion in the National Wild and Scenic River system will be addressed on a case by case basis. Whenever any proposed action would affect these values, impacts will be addressed in the NEPA document, and mitigation and alternatives will be considered to avoid such impacts. National Monument designation provides protective management direction regardless of WSR designation.

Appendix 6

Areas of Critical Environmental Concern

APPENDIX 6 - AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Introduction

Areas of Critical Environmental Concern (ACEC) were considered by an evaluation team to see if they met the designation criteria. Nominations were also considered in light of the special management attention they would receive through the establishment of the Monument. The Monument is unique in the realm of Bureau of Land Management (BLM) public lands administration in regards to the need for ACECs. After careful evaluation of the resources recognized in each of the nominations, it was determined that the protection of would be equivalent under either Monument authority or ACEC designation. Therefore, it was concluded that no ACECs will be designated under the Monument Management Plan.

Existing special management areas such as Outstanding Natural Areas (ONAs) and Research Natural Areas (RNAs) were also considered for ACEC protection. The original designations are recommended to be preserved because of the historical context of these units to Monument lands and to Glen Canyon National Recreation Area, and also due to public recognition through time.

Evaluation Criteria:

To be considered for designation as an ACEC, an area must meet the requirements of relevance and importance as described in the Code of Federal Regulations (43 CFR 1610.7.2). The definitions for the criteria of relevance and importance are as follows:

Relevance

An area is considered relevant if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (for example: rare or sensitive archeological resources and religious or cultural resources important to Native Americans).
2. A fish and wildlife resource (for example: habitat for endangered, sensitive, or threatened species, or habitat essential for maintaining species diversity).
3. A natural process or system (for example: endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities; rare geologic features).
4. A natural hazard (for example: areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

Importance

The value, resource, system, process, or hazard described above must have substantial significance to satisfy the importance criteria. This generally means it is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.
2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.
3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of Federal Land Policy and Management Act.
4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.
5. Poses a significant threat to human life and safety or to property.

HR 1500 Areas

Nominations were received from Southern Utah Wilderness Alliance (SUWA) during the earlier 1994 planning process for the Escalante/Kanab Resource Management Plan

APPENDIX 6 - AREAS OF CRITICAL ENVIRONMENTAL CONCERN

(RMP) and from more recent 1998 correspondence from both SUWA and from the Wilderness Society. In their correspondence, they requested the protection of areas being proposed in legislation for wilderness designation. Specifically noted were the protection of wilderness values. It is explicit in the current BLM Planning Manual (1613.06) that ACECs are not to be designated to protect areas for wilderness values:

"The FLPMA requires that priority shall be given to the designation and protection of ACECs. The ACECs are identified, evaluated, and designated through BLM's resource management planning process. An ACEC designation is the principal BLM designation for public lands where special management is required to protect important natural, cultural and scenic resources, or to identify natural hazards. Therefore, BLM managers will give precedence to the identification, evaluation, and designation of areas which require "special management attention" during resource management planning. *"An ACEC designation will not be used as a substitute for wilderness suitability recommendations."* (Italics added)

In compliance with this policy, nominations of HR1500 areas were not considered since the values to be protected were wilderness values. BLM wilderness suitability is being considered outside the plan.

ACEC Nominations

The following nominations were received as of June 23, 1998:

1. Owen Severance - Fourmile Bench Old Tree Area (Received March 2, 1998)
2. Utah Farm Bureau (John B. Keeler) - 48 Grazing Allotments (Received March 3, 1998)
3. Utah Trail Machine Association - Propose No ACECs be designated (Received March 9, 1998)
4. The Nature Conservancy of Utah (Joel S. Tuhy) - Nomination "that the existing No Mans Mesa Research Natural Area (RNA) be formally designated as an ACEC through the Monument planning process that is now underway." (Received March 16, 1998)
5. SUWA - A nomination requesting that the HR1500 areas within the Monument (see Wilderness at the Edge) become ACECs to protect wilderness values. (Received March 19, 1998)
6. Grand Canyon Wildlands Council (Kelly Burke) - They "maintain that ACEC criteria applies to, and is met by, the Grand Staircase-Escalante National Monument as an ecological whole." "...The Grand Canyon Wildlands considers the entire Monument an Area of Critical Environmental Concern. When applied to smaller units, it seems problematic whether ACEC status would provide and additional meaningful layer of protection, and such designations may prove counterproductive in protecting the Monument." (Received March 20, 1998)
7. John R. Swanson - Urges that the entire Grand Staircase-Escalante National Monument become an Area of Critical Environmental Concern. (Received about March 23, 1998)
8. Southern Utah Wilderness Alliance - They have determined that the entire Monument qualifies for protection under the ACEC category. They ask that previous SUWA correspondence on this issue be disregarded. (Received March 23, 1998)
9. The Wilderness Society - They do incorporate by reference the ACEC nominations made in 1994 by SUWA, plus Fortymile Gulch and Hurricane Wash (Received March 23, 1998)
10. Southern Utah Wilderness Alliance - Another letter, received April 9, 1998, discussed the use of ACECs in protecting Wilderness Values in the Monument
11. Utah Farm Bureau - A second letter received April 15 from John B. Keeler stated that the Farm Bureau felt that Monument designation provides adequate protection without ACECs

APPENDIX 6 - AREAS OF CRITICAL ENVIRONMENTAL CONCERN

TABLE A6.1
AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACECS)

RESOURCE VALUE	LOCATION	EVALUATION/COMMENTS
Entire Monument	Area within Monument	The entire Monument was found to qualify under both relevance and importance. Monument designation already gives authority to provide special management emphasis. Designating the entire Monument as an ACEC would be duplicative.
Grazing Allotments	All allotments within the Monument	Grazing allotments may have historical relevance, but do not qualify under the criteria for importance. Consensus by evaluators that they do not need special management. Nominations subsequently withdrawn by nominee.
Scenic Access Routes	US-89; Utah 12, 9, and 143; Cottonwood Wash Road from Utah 12 to US 89; the road to Pahreah Townsite from US 89; the Burr Trail from Boulder to Capitol Reef; and the Hole-in-the-Rock Road from Utah 12 to Glen Canyon NRA.	Scenic Access Routes are historically relevant. U-12, Cottonwood, Old Pahreah, Burr Trail, and Hole-in-the-Rock Trail have more than local significance. ACEC probably is not the right tool.
Fourmile Bench Old Tree Area	Fourmile Bench	The Old Tree area is relevant as a natural system and is of more than local significance. It is also irreplaceable, and vulnerable to adverse change.
No Mans Mesa	About 30 miles northwest of Kanab.	No Mans Mesa is a historically relevant natural system, and relict plant community. It is also irreplaceable and vulnerable to adverse change. Continue designation as a Research Natural Area.

Appendix 7

Standards & Guidelines for Healthy Rangelands

APPENDIX 7 - STANDARDS AND GUIDELINES FOR HEALTHY RANGELANDS

INTRODUCTION

The following policies, practices, and procedures will be implement in order to ensure that Bureau of Land Management (BLM) lands are healthy. The concept of healthy rangelands expresses the BLM's desire to maintain or improve productivity of plant, animal (including livestock), soil, and water resources at a level consistent with the ecosystem's capability.

In order to meet society's needs and expectations for *sustained* production and conservation of natural resources from BLM rangelands, use of these lands must be kept in balance with the land's ability to sustain those uses. Identifying that balance requires an understanding and application of ecological principles that determine how living and non-living components of rangelands interact. Recognition of the inter-dependence of soil, water, plants, and animals (including livestock) is basic to maintaining healthy rangelands and the key element in BLM's proposed Standards and Guidelines.

The policies, practices, and procedures contained in this document are referred to as Standards and Guidelines. Standards and Guidelines will apply to all uses of BLM land for forage, including livestock, wildlife, wild horses, and burros.

Standards describe desired ecological conditions that BLM intends to attain in managing BLM lands, whereas Guidelines define practices and procedures that will be applied to achieve Standards. While Standards will initially be applied to grazing, it is BLM's intent to eventually apply these Standards to all rangeland uses that have the ability to affect or be affected by the ecological characteristics of rangelands.

FUNDAMENTALS OF RANGELAND HEALTH

The Bureau of Land Management has defined four Fundamentals of Rangeland Health, which are the basic ecological principles underlying sustainable production of rangeland resources. These Fundamentals are embodied in BLM's new Grazing Regulation (43 Code of Federal Regulations, Part 4100), which became effective in August of 1995. These four Fundamentals of Rangeland Health, which also serve as the basis for Standards and Guidelines for Grazing Management, are as follows:

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian/wetland, and aquatic components; soil and plant conditions support water infiltration, soil moisture storage, and release of water that are in balance with climate and landform, and maintain or improve water quality, water quantity, and timing and duration of flow.
2. Ecological processes, including the hydrologic cycle, nutrient cycles, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.
3. Water quality complies with state water quality standards and achieves, or is making progress toward achieving, established BLM management objectives such as meeting wildlife needs.
4. Habitats are, or are making significant progress towards being, restored or maintained for Federal threatened and endangered species, Federal proposed, Federal candidate, other special status species, native species, and for economically valuable game species and livestock.

By developing Standards and Guidelines based on the Fundamentals listed above, and by applying those Standards and Guidelines to BLM land management, it is BLM's intent to achieve the following:

1. Promote healthy, sustainable rangeland ecosystems that produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, wild horse and burro habitat, clean water, clean air, etc.

APPENDIX 7 - STANDARDS AND GUIDELINES FOR HEALTHY RANGELANDS

2. Accelerate restoration and improvement of public rangelands to properly functioning condition, where appropriate.
3. Provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy rangelands.
4. Ensure that BLM land users and stakeholders have a meaningful voice in establishing policy and managing BLM rangelands.

STANDARDS AND GUIDELINES

Standards are descriptions of the desired condition of the biological and physical components and characteristics of rangelands. Standards:

- are measurable and attainable;
- comply with various Federal and state statutes, policies, and directives applicable to BLM rangelands;
- establish goals for resource condition and parameters for management decisions.

Indicators are features of an ecosystem that can be measured or observed in order to gain an understanding of the relative condition of a particular landscape or portion of a landscape. Indicators will be used by the rangeland manager to determine if Standards are being met. The indicators proposed for use are commonly accepted and used by members of the rangeland management profession in monitoring rangelands. Methods and techniques for evaluating these indicators are also commonly available. In using these terms, it should be recognized that not every indicator applies equally to every acre of land or to every ecological site. Additional indicators not listed below may need to be developed for some rangelands depending upon local conditions.

Similarly, because of natural variability, extreme degradation, or unusual management objectives, discretion will be used in applying Standards. Judgements about whether a site is meeting or failing to meet a Standard must be tempered by a knowledge of the site's potential. Examples of this are thousands of acres of the Great Basin in western Utah where native perennial grass species' have been replaced by cheatgrass, an annual exotic species. It will be difficult and expensive to return all those areas to their natural potential because they have been greatly altered. It may not even be feasible to restore such areas from such an altered state to a state similar to "natural" conditions.

Site potential is determined by soil, geology, geomorphology, climate, and landform. Standards must be applied with an understanding of the potential of the particular site in question, as different sites have differing potentials.

Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

- typically identify and prescribe methods of influencing or controlling specific public land uses
- are developed and applied consistent with the desired condition and within site capability
- may be adjusted over time.

It should be understood that these Standards and Guidelines are to be applied in making specific grazing management decisions. However, it should also be understood that they are considered the minimum conditions to be achieved. Flexibility must be used in applying these policy statements because ecosystem components vary from place to place and ecological interactions may be different.

Standards and Guidelines for use on BLM Land in Utah are described in the following pages. Standards and Guidelines, once approved by the Secretary of the Interior, will be implemented through subsequent Resource Management Plans (RMPs) and other decisions by BLM officials involving matters related to management of grazing. Where applicable, the statewide Guidelines may be adopted as terms and conditions for grazing permits and leases. Additional Guidelines may be identified and implemented through subsequent Resource Management Plans and activity plans to address local situations not dealt with by the statewide Guidelines.

STANDARDS FOR RANGELAND HEALTH

Standard 1. Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform. This is indicated by:

a. Sufficient cover and litter to protect the soil surface from excessive water and wind erosion, promote infiltration, detain surface flow, and retard soil moisture loss by evaporation

b. The absence of indicators of excessive erosion such as rills, soil pedestals, and actively eroding gullies

c. The appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community (DPC), where identified in a land use plan conforming to these Standards, or (2) where the DPC is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological processes

Standard 2. Riparian and wetland areas are in properly functioning condition. Stream channel morphology and functions are appropriate to soil type, climate and landform. This is indicated by:

a. Streambank vegetation consisting of, or showing a trend toward, species with root masses capable of withstanding high streamflow events, vegetative cover adequate to protect stream banks and dissipate streamflow energy associated with high-water flows, protect against accelerated erosion, capture sediment, and provide for groundwater recharge

b. Vegetation reflecting: Desired Plant Community, maintenance of riparian and wetland soil moisture characteristics, diverse age structure and composition, high vigor, large woody debris when site potential allows, and providing food, cover, and other habitat needs for dependent animal species

c. Re-vegetating point bars, lateral stream movement associated with natural sinuosity, channel width, depth, pool frequency, and roughness appropriate to landscape position

d. Active floodplain

Standard 3. Desired species, including native, threatened, endangered, and special-status species, are maintained at a level appropriate for the site and species involved. This is indicated by:

a. Frequency, diversity, density, age classes, and productivity of desired native species necessary to ensure reproductive capability and survival

b. Habitats connected at a level to enhance species survival

c. Native species re-occupy habitat niches and voids caused by disturbances unless management objectives call for introduction or maintenance of non-native species

d. Habitats for threatened, endangered, and special-status species managed to provide for recovery and move species toward de-listing

e. Appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community (DPC),where identified in a land use plan conforming to these Standards, or (2) where the DPC is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological processes

Standard 4. BLM will apply and comply with water quality standards established by the State of Utah (R.317-2) and the Federal Clean Water and Safe Drinking Water Acts. Activities on BLM lands will fully support the designated beneficial uses described in the

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APPENDIX 7 - STANDARDS AND GUIDELINES FOR HEALTHY RANGELANDS

Utah Water Quality Standards (R.317-2) for Surface and Groundwater. This is indicated by:

a. Measurement of nutrient loads, total dissolved solids, chemical constituents, fecal coliform, water temperature and other water quality parameters

b. Macro invertebrate communities that indicate water quality meets aquatic objectives

GUIDELINES FOR GRAZING MANAGEMENT

1. Grazing management practices will be implemented which:
    a. Maintain sufficient residual vegetation and litter on both upland and riparian sites to protect the soil from wind and water erosion and support ecological functions
    b. Promote attainment or maintenance of proper functioning condition riparian/wetland areas, appropriate stream channel morphology, desired soil permeability and infiltration, and appropriate soil conditions and kinds and amounts of plants and animals to support the hydrologic cycle, nutrient cycle and energy flow
    c. Meet the physiological requirements of desired plants and facilitate reproduction and maintenance of desired plants to the extent natural conditions allow
    d. Maintain viable and diverse populations of plants and animals appropriate for the site
    e. Provide or improve, within the limits of site potentials, habitat for threatened or endangered species
    f. Avoid grazing management conflicts with other species that have the potential of becoming protected or special status species
    g. Encourage innovation, experimentation and the ultimate development of alternatives to improve rangeland management practices
    h. Give priority to rangeland improvement projects and land treatments that offer the best opportunity for achieving the Standards
2. Any spring and seep developments will be designed and constructed to protect ecological process and functions and improve livestock, wild horse, and wildlife distribution.
3. New rangeland projects for grazing will be constructed in a manner consistent with the Standards. Considering economic circumstances and site limitations, existing rangeland projects and facilities that conflict with the achievement or maintenance of the Standards will be relocated and/or modified.
4. Livestock salt blocks and other nutritional supplements will be located away from riparian/wetland areas , other permanently located, or other natural water sources. It is recommended that the locations of these supplements be moved every year.
5. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.
6. When rangeland manipulations are necessary, the best management practices, including biological processes, fire, and intensive grazing will be utilized prior to the use of chemical or mechanical manipulations.
7. When establishing grazing practices and rangeland improvements, the quality of the outdoor recreation experience is to be considered. Aesthetic and scenic values, water, campsites, and opportunities for solitude are among those considerations.

8. Feeding of hay and other harvested forage (which does not refer to miscellaneous salt, protein, and other supplements), for the purpose of substituting inadequate natural forage, will not be conducted on BLM lands other than in (a) emergency situations where no other resource exists and animal survival is in jeopardy, or (b) situations where the Authorized Officer determines such a practice will assist in meeting a Standard or attaining a management objective.
9. In order to eliminate, minimize, or limit the spread of noxious weeds, (a) only hay cubes, hay pellets, or certified weed-free hay will be fed on BLM lands, and (b) reasonable adjustments in grazing methods, methods of transport, and animal husbandry practices will be applied.
10. To avoid contamination of water sources and inadvertent damage to non-target species, aerial application of pesticides will not be allowed within 100 feet of a riparian/wetland area unless the product is registered for such use with the Environmental Protection Agency.
11. On rangelands where a Standard is not being met, and conditions are moving toward meeting the Standard, grazing may be allowed to continue. On lands where a Standard is not being met, conditions are not improving toward meeting the Standard or other management objectives, and livestock grazing is deemed responsible, administrative action with regard to livestock will be taken by the Authorized Officer pursuant to CFR 4180.2(c).
12. Where it can be determined that more than one kind of grazing animal is responsible for failure to achieve a Standard, and adjustments in management are required, those adjustments will be made to each kind of animal, based on interagency cooperation as needed, in proportion to their degree of responsibility.
13. Rangelands that have been burned, reseeded, or otherwise treated to alter vegetative composition will be closed to livestock grazing as follows: (a) burned rangelands, whether by wildfire or prescribed burning, will be ungrazed for a minimum of one complete growing season following the burn; (b) rangelands that have been reseeded or otherwise chemically or mechanically treated will be ungrazed for a minimum of two complete growing seasons following treatment.
14. Conversions in kind of livestock (such as from sheep to cattle) will be analyzed in light of Rangeland Health Standards. Where such conversions are not adverse to achieving a Standard, or they are not in conflict with land BLM use plans, the conversion will be allowed.

MONITORING AND ASSESSMENT

The determination of whether or not a particular grazing unit, pasture or allotment is meeting a Standard will be made by the Authorized Officer based on rangeland assessments and monitoring.

Monitoring the indicators will be in the form of recorded data from study sites or transects. It may be supplemented by visual observations and other data by BLM or other agency personnel, ranchers, interested public, wildlife agency personnel, or other resource data.

Assessments are the interpretation of data, observations, and related research findings. Assessments are the usual basis for prescribing grazing adjustments or practices. In some cases, such as with threatened or endangered species, Section 7 consultation with the U. S. Fish and Wildlife Service under the Endangered Species Act will occur. In all cases, conformance with Standards and Guidelines is a local decision based on local circumstances involving a collaborative process with affected interests

Should an assessment determine that an allotment is not meeting a Standard and/or significant progress toward meeting a Standard is not occurring, the next step is to determine the cause of failing to meet the Standard. If that determination reveals that grazing is involved or partially responsible, the Authorized Officer, with involvement of the interested parties, will prescribe actions that ensure progress toward meeting the Standard. Those actions may be a part of an activity plan, a coordinated management plan, or an administrative decision. Corrective management actions will be based on actual on-the-ground data and conditions.

(Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah, USDI, BLM, May 1997)

Appendix 8

Visual Resource Management Classes

APPENDIX 8 - VISUAL RESOURCE MANAGEMENT CLASSES

INTRODUCTION

Visual resource management (VRM) classes are assigned through the planning process. All actions proposed that would result in surface disturbances must consider the importance of the visual values and the impacts the project may have on these values.

VRM CLASS OBJECTIVES:

Class I - The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II - The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III - The objective if this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the landscape.

Class IV - The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

VISUAL RESOURCE MANAGEMENT CLASS OBJECTIVES APPLICATION (STIPULATIONS OR MITIGATION OR PRESCRIPTIONS)

1. While performing an environmental analysis for projects, the visual resource contrast rating system would be utilized, as a guide, to analyze potential visual impacts of the proposal. The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. Projects would be designed to resolve and minimize potential impacts and meet or exceed the visual resource management class objectives. Some types of projects such as rights-of-way requests, valid existing rights., or ingress to private land may be allowed on a case by case basis in Class II or III areas. Visual resource impacts in these instances would be minimized by such measures, but not limited to screening, painting, project design, relocation, or reclamation.
2. The Monument Manager may allow temporary projects, such as research projects, to exceed VRM standards in Class II-IV areas, if the project terminates within two years of initiation. Rehabilitation begins at the end of the two year period. During the temporary project, the Manager may require phased mitigation to better conform with prescribed VRM standards.
3. VRM classes acknowledge existing visual contrasts. Existing facilities or visual contrasts will be brought into VRM class conformance as the need or opportunity arises (i.e. rights-of-way renewals, mineral material site closures, abandoned mine rehabilitation, other structures).
4. VRM Class I is assigned to designated wilderness areas and the designated wild segments of national wild and scenic rivers, and may be assigned to other administratively designated areas where a management decision is made to maintain a natural landscape.

Appendix 9

Wilderness Study Areas

APPENDIX 9 - WILDERNESS STUDY AREAS

TABLE A9.1
WILDERNESS STUDY AREAS

NAME	ACRES[1]
Phipps-Death Hollow Instant Study Area (ISA)	42,731
Steep Creek Wilderness Study Area (WSA)	21,896
North Escalante Canyons/The Gulch ISA	119,752
Carcass Canyon WSA	46,711
Scorpion WSA	35,884
Escalante Canyons Tract 1 ISA	360
Escalante Canyons Tract 5 ISA	760
Devils Garden ISA	638
The Blues WSA	19,030
Fiftymile Mountain WSA	146,143
Death Ridge WSA	62,870
Burning Hills WSA	61,550
Mud Spring Canyon WSA	38,075
The Cockscomb WSA	10,080
Paria/Hackberry and Paria/Hackberry 202 WSA	135,822
Wahweap WSA	134,400

[1] WSA/ISA acres are total BLM acres from Utah Statewide Wilderness Study Report, October 1991

Appendix 10

Paleontology

APPENDIX 10 - PALEONTOLOGY

TABLE A10.1
EXPOSED ROCK UNITS AND ASSOCIATED FOSSILS

FORMATION	AGE	FOSSILS
unnamed	Quaternary	possible Pleistocene fossils (mammoth, bison, plants, etc.)
Claron *	Tertiary	leaves, pollen, snails, clams, turtles
Canaan Peak *	Tertiary/ Cretaceous	not known in the Monument
Kaiparowits	Cretaceous	plants, pollen, clams, snails, sharks, rays, fish, amphibians, turtles, lizards, crocodiles, birds, dinosaurs, mammals
Wahweap	Cretaceous	plants, petrified wood, clams, snails, ostracodes, fish, amphibians, turtles, lizards, crocodiles, dinosaurs, mammals
Straight Cliffs	Cretaceous	plants, petrified wood, leaves, carbonized wood, pollen, corals, bryozoans, snails, clams, ammonoids, sharks, fish, salamanders, frogs, turtles, lizards, crocodiles, pterosaurs, dinosaurs, mammals, dinosaur tracks
Tropic Shale	Cretaceous	plants, clams, snails, ammonoids, crabs, worms, sharks, fish, marine reptiles
Dakota	Cretaceous	plants, petrified wood, pollen, snails, clams, ammonoids, worm tracks, ostracodes, sharks, rays, fish, salamanders, turtles, lizards, crocodiles, dinosaurs, mammals
Morrison	Jurassic	petrified wood, dinosaurs
Summerville, Henrieville, Romana	Jurassic	not known in the Monument
Entrada Sandstone	Jurassic	dinosaur tracks
Carmel	Jurassic	plants, algae, corals, brachiopods, bivalves, snails, ammonoids, crinoids, echinoids, ostracodes, and worm traces
Temple Cap Sandstone	Jurassic	not known in the Monument
Navajo Sandstone	Jurassic	dinosaur tracks, other reptile tracks
Kayenta	Jurassic	petrified wood, clams, reptile tracks, worm traces

APPENDIX 10 - PALEONTOLOGY

FORMATION	AGE	FOSSILS
Moenave	Jurassic	pollen, fish, crocodiles, dinosaur tracks, tracks of insects and worms
Wingate Sandstone	Jurassic	dinosaur tracks
Chinle	Triassic	petrified wood, plants, snails, clams, insects, insect traces, fish, lungfish burrows, phytosaurs, reptile tracks
Moenkopi	Triassic	plants, snails, clams, ammonoids, crinoids, echinoids, ostracodes, fish, tracks of reptiles and arthropods
Kaibab	Permian	brachiopods, bryozoans, clams, snails, corals, sponges, algal stromatolites, cephalopods, trilobites, conodonts
Toroweap-White Rim, Coconino	Permian	clams, brachiopods, crinoids
Hermit Shale	Permian	land plants, insects, amphibian tracks, worm traces

* Does not crop out in the Monument.
Exposed rock units (from Allison, 1997, after Doelling and Davis, 1989) and summary of their fossil content. (Modified from Gillette and Hayden (1997) with some new information added.)

Appendix 11

Vegetation Associations

APPENDIX 11 - VEGETATION ASSOCIATIONS

TABLE A11.1
VEGETATION ASSOCIATIONS

VEGETATION ASSOCIATION	ACRES*	DOMINANT SPECIES
Salt desert shrub	476,149	shadscale (*Atriplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), squirreltail (*Sitanion hystrix*), alkali sacaton (*Sporobolus airoides*) and galleta grass (*Hilaria jamesii*)
Sand shrub	53,539	sand sage (*Artemisia filifolia*), big sagebrush (*Artemisia tridentata*), four-wing saltbush (*Atriplex canescens*), and a variety of perennial grasses
Warm desert shrub	73,403	blackbrush (*Coleogyne ramosissima*), shadscale (*Atriplex confertifolia*), galleta grass (*Hilaria jamesii*), indian ricegrass (*Stipa hymenoides*), and sand dropseed (*Sporobolus cryptandrus*)
Grassland	262,888	needle-and-thread (*Stipa comata*), sand dropseed (*Sporobolus cryptandrus*), blue gramma (*Bouteloua gracilis*), indian ricegrass (*Stipa hymenoides*), and galleta grass (*Hilaria jamesii*) perennial shrubs such as sagebrush (*Artemisia* spp.) are scattered among this association
Cool desert shrub	193,302	big sagebrush (*Artemisia tridentata*), black sagebrush (*Artemisia nova*), bitterbrush (*Purshia tridentata*), four-wing saltbush (*Atriplex canescens*), snakeweed (*Gutierrezia sarothrae*) and a variety of perennial grasses
Piñon/Juniper	723,378	piñon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*) are the dominant large shrubs, understory includes big sagebrush (*Artemisia tridentata*), bitterbrush (*Purshia tridentata*), and a variety of perennial grasses
Mountain shrub	25,156	gambel oak (*Quercus gambelii*), manzanita (*Arctostaphylos patula*), mahogany (*Cercocarpus* spp.), and serviceberry (*Amelanchier utahensis*)
Ponderosa pine	2,797	ponderosa pine (*Pinus ponderosa*), with lesser amounts of white fir (*Abies concolor*), and quaking aspen (*Populus tremuloides*), this association also supports a variety of shrubs and grasses in the understory
Riparian	826	willows (*Salix* spp.) and cottonwood (*Populus fremontii*). Tamarisk (*Tamarix chinensis*) and Russian olive (*Eleagnus angustifolia*) also occupy large areas of riparian habitat.

*From Utah GAP Analysis data, using 1 hectare resolution satellite imagery

Appendix 12

Special Status Plant Species

APPENDIX 12 - SPECIAL STATUS PLANT SPECIES

TABLE A12.1
SPECIAL STATUS PLANT SPECIES

COMMON NAME	SCIENTIFIC NAME	STATUS		
		BLM[1]	FEDERAL[1]	UTNHP[2]
Slender camissonia	*Camissonia exilis*	S		G1/S1
Jones' cycladenia	*Cycladenia humilis var. jonesii*	T	T	G3G4T2/S2
Higgins biscuitroot	*Cymopteris acualis var. higginsii*	S		G5T1/S1
Hole-in-the-rock prairie clover	*Dalea flavescens var. epica*	S		G5T1Q/S1
Alcove daisy	*Erigeron zothecinus*	S		G1Q/S1
Spiny gilia	*Gilia latifolia var. imperialis*	S		G4T2/S2
Alcove bog-orchid	*Habenaria zothecina*	S		
Kodachrome bladderpod	*Lesquerella tumulosa*	E	E	G1Q/S1
Kane breadroot	*Pediomelum epipsilum*	S		G1/S1
Sandloving penstemon	*Penstemon ammophilus*	S		G2G3/S2S3
Ute ladies'-tresses	*Spiranthes diluvialis*	T	T	G2/S1
Cronquist's woody aster	*Xylorhiza cronquistii*	S		G1QS1

1. **S** = Utah BLM sensitive species (1996) **E** = Federally listed endangered species **T** = Federally listed threatened species

2. **Utah Natural Heritage Program Status Rank** (Utah Reclamation Mitigation and Conservation Commission, U.S. Department of the Interior, Utah Division of Wildlife Resources. 1997. *Inventory of Sensitive Species and Ecosystems in Utah - Endemic and Rare Plants of Utah: An Overview of Their Distribution and Status*)

A numeric rank (1 through 5) is assigned to indicate the status of a species at both the Global or rangewide level (G) and at the State level (S). Where appropriate, a Trinomial rank (T) is also assigned to indicate the rangewide distribution and abundance at the infraspecific (variety or subspecies) level.

These ranks are based primarily on the number of occurrences of the species, along with other factors such as overall abundance, extent of geographic range, population trends, and threats. The range in number of occurrences suggested for each numeric rank is not an absolute guideline, but only the starting point in the ranking process:

G1 or T1 or S1	Indicates extreme rarity or other factor(s) making the species especially vulnerable to extinction or extirpation (typically 5 or fewer occurrences or very few remaining individuals or acres).
G2 or T2 or S2	Indicates rarity or other factor(s) making the species very vulnerable to extinction or extirpation (6 to 20 occurrences or few remaining individuals or acres).
G3 or T3 or S3	Indicates a species that is either very rare and local throughout its range or found locally (even abundantly at some of its locations) within a restricted range, or vulnerable to extinction or extirpation because of other factors (21 to 100 occurrences).
G4 or T4 or S4	Indicates a species that is widespread, abundant, and apparently secure, though it may be quite rare in parts of its range, especially at the periphery (usually more than 100 occurrences).
G5 or T5 or S5	Indicates a species that is demonstrably widespread, abundant, and secure, though it may be quite rare in parts of its range.

A range spanning two (or even three) of the numeric ranks denotes a range of uncertainty about the exact status of the species (e.g., S1S2); ranges cannot skip more than one rank (e.g., S1S4 is not allowed). A qualifier of "Q" is added to a rank to denote a taxonomic question.

Appendix 13

Fish and Wildlife Consultation

APPENDIX 13 - FISH AND WILDLIFE CONSULTATION

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

GRAND STAIRCASE
• ESCALANTE •
MAY 01 1998

In Reply Refer To:
[illegible]

April 30, 1998

A. Jerry Meredith, Monument Manager
Bureau of Land Management
Grand Staircase-Escalante National Monument
337 South Main Street, Suite 010
Cedar City, Utah 84720

Subject: Endangered and Threatened Species Consultation for the Grand Staircase-Escalante National Monument, Garfield and Kane Counties, Utah

Dear Mr. Meredith:

The U.S. Fish and Wildlife Service (Service) received your letter on April 6, 1998 requesting a list of threatened and endangered species which may occur in the area of influence of the subject proposed action. The following species occur in Garfield and/or Kane Counties, and may occur in the subject project's area of influence:

Common Name	Scientific Name	Status
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
California Condor	*Gymnogyps californianus*	Endangered[1]
Colorado Squawfish	*Ptychocheilus lucius*	Endangered
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	Threatened
Kodachrome Bladder Pod	*Lesquerella tumulosa*	Endangered
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened
Peregrine Falcon	*Falco peregrinus*	Endangered
Razorback Sucker	*Xyrauchen texanus*	Endangered
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened

In addition, the Service requests that you survey for Kanab ambersnail (*Oxyloma haydeni kanabensis*) where suitable habitat conditions exist within the Monument. Although this species has not been documented within the boundaries of what is now the Grand Staircase-Escalante National Monument, it may occur there.

Only a Federal agency can enter into formal Endangered Species Act (ESA) section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

The draft Environmental Impact Statement should be reviewed and a determination made if the proposed alternative may affect any listed species or its critical habitat. A determination also should be made if the proposed alternative is likely to jeopardize a proposed species or result in the destruction or adverse modification of any proposed critical habitat. If the determination is "may affect" for listed species, formal ESA section 7 consultation should be requested by the Federal agency to the Field Supervisor at the address given above. In addition, if a determination is made that the proposed alternative may jeopardize proposed species or result in the destruction or adverse modification of proposed critical habitat, the Federal agency must confer with this office. At that time, the Federal agency should provide this office with a copy of a biological assessment or any other relevant information that was used in reaching its conclusion.

Your attention is also directed to section 7(d) of the ESA, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

The Service looks forward to working with you to further recovery of threatened and endangered species of plants and wildlife found within the Monument. If further assistance is needed, please contact Ted Owens, Wildlife Biologist, of this office at telephone (801) 524-5001.

Sincerely,

for Reed E. Harris
Field Supervisor

---

[1] Experimental, Nonessential Population

Appendix 14

Noxious Weed List

APPENDIX 14 - NOXIOUS WEED LIST

TABLE A14.1
NOXIOUS WEEDS

COMMON NAME	SCIENTIFIC NAME	FAMILY	Location[1]	List[2]
Bermuda grass	*Cynodon dactylon*	Poaceae (Gramineae)	X	S, F
Bindweed (wild morning-glory)*	*Convolvulus arvensis*	Convolvulaceae	P	S, F
Broad-leaved peppergrass (tall whitetop)	*Lepidium latifolium*	Brassicaceae (Cruciferae)	P	S, F
Bull thistle	*Cirsium vulgare*	Asteraceae (Compositae)	P	F
Candada thistle	*Cirsium arvense*	Asteraceae (Compositae)	C	S, F
Dalmation toadflax	*Linaria dalmatica*	Scrophulariaceae	P	NS, F
Diffuse knapweed	*Centaurea diffusa*	Asteraceae (Compositae)	X	S, F
Dyers woad	*Isatis tinctoria*	Brassicaceae (Cruciferae)	C	S, F
Jointed goatgrass*	*Aegilops cylindrica*	Poaceae (Gramineae)	P	NS, F
Leafy spurge	*Euphorbia esula*	Euphorbiaceae	C	S, F
Mediterranean grass	*Schismus barbatus*	Poaceae (Gramineae)	P	F
Medusahead	*Taeniatherum caput-medusae*	Poaceae (Gramineae)	X	S, F
Musk thistle	*Carduus nutans*	Asteraceae (Compositae)	C	S, F
Perennial sorghum (including but not limited to	*Sorghum halepense*	Poaceae (Gramineae)	C	S, F
Purple loostrife	*Lythrum salicaria*	Lythraceae	C	NS, F
Quackgrass*	*Agropyron repens*	Poaceae (Gramineae)	P	S, F
Russian knapweed*	*Centaurea repens*	Asteraceae (Compositae)	P	S
Russian olive*	*Eleagnus angustifolia*	Eleagnaceae	P	F
Saltcedar (tamarisk)*	*Tamarix ramosissima*	Tamaricaceae	P	F
Scotch thistle (cotton thistle)*	*Onopordum acanthium*	Asteraceae (Compositae)	P	S, F

APPENDIX 14 - NOXIOUS WEED LIST

COMMON NAME	SCIENTIFIC NAME	FAMILY	Location[1]	List[2]
Silverleaf nightshade	*Solanum eleagnifolium*	Solanaceae	P	NS
Spotted knapweed	*Centaurea maculosa*	Asteraceae (Compositae)	P	S, F
Squarrose knapweed	*Centaurea virgata ssp. squarrosa*	Asteraceae (Compositae)	C	S, F
Waterhemlock	*Cicuta maculata*	Apiaceae (Umbelliferae)	P	NS
Western Whorled Milkweed*	*Asclepias subverticillata*	Asclepiadaceae	P	K
Whitetop (hoary cress)*	*Cardaria draba*	Brassicaceae (Cruciferae)	P	S, F
Yellow starthistle	*Centaurea solstitialis*	Asteraceae (Compositae)	C	S, F
* Plants found in the Monument during the 1997 survey project.				

1. **C** = Close to Monuemnt, but currently not found in Monument **P** = Present in Monument **X** = Not found in Monument, but of concern

2. **S** = State list **NS** = New invaders on State list **F** = Federal list **K** = Kane county list (no additional plants have been added by Garfield Co.)

Appendix 15

Wildlife Species

APPENDIX 15 - WILDLIFE SPECIES

TABLE A15.1
WILDLIFE SPECIES LIST FOR GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Amphibian species					
Boreal Chorus Frog	*Pseudacris triseriata maculata*	ND			
Bullfrog (non-native)	*Rana catesbeiana*	ND			
Canyon treefrog	*Hyla arenicolor*	X		X	
Northern Leopard Frog	*Rana pipiens brachycephala*	X		X	
Tiger Salamander	*Ambystoma tigrinum nebulosum*	X	X	X	
Boreal Toad	*Bufo boreas boreas*	ND			FC
Great Basin Spadefoot Toad	*Spea intermontana*	X	X	X	
Great Plains Toad	*Bufo cognatus*			X	
New Mexico Spadefoot Toad	*Spea multiplicata*			X	
Red Spotted Toad	*Bufo punctatus*	X	X	X	
Arizona Toad	*Bufo microscaphus microscaphus*	X			SP
Woodhouse's Toad	*Bufo woodhousei woodhousei*	X	X	X	
Avian species					
American Avocet	*Recurvirostra americana*	X		X	
American Bittern	*Botaurus lentiginosus*	X		X	
Brewer's Blackbird	*Euphagus carolinus*	X	X	X	
Red-winged Blackbird	*Agelaius phoeniceus*	X	X	X	
Rusty Blackbird	*Euphagus carolinus*	X			
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	X		X	
Mountain Bluebird	*Sialia currucoides*	X	X	X	
Western Bluebird	*Sialia mexicana*	X	X	X	
Bobolink	*Dolichonyx oryzivorus*	ND			SP/SD
Bufflehead	*Bucephala albeola*	X		X	TAKE

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Indigo Bunting	*Passerina cyanea*	X			
Lark Bunting	*Calamospiza melanocorys*	ND			
Lazuli Bunting	*Passerina amoena*	X	X	X	
Snow Bunting	*Plectrophenax nivalis*	ND			
Bushtit	*Psaltriparus minimus*	X	X	X	
Canvasback	*Aythya valisineria*	X		X	TAKE
Grey Catbird	*Dumetella carolinensis*	ND			
Yellow-breasted Chat	*Icteria virens*	X	X	X	
Black-capped Chickadee	*Parus atricapillus*	X			
Mountain Chickadee	*Parus gambeli*	X	X	X	
Chukar	*Alectoris chukar*	X	X	X	TAKE
California Condor	*Gymnogyps californianus*	X	X	X	FE
American Coot	*Fulica americana*	X	X	X	TAKE
Double-crested Cormorant	*Phalacrocorax auritus*	X		X	
Brown-headed Cowbird	*Molothrus ater*	X	X	X	
Sandhill Crane	*Grus canadensis*	ND			TAKE
Brown Creeper	*Certhia familiaris*	X	X	X	
Red Crossbill	*Loxia curvirostra*	X	X	X	
White-winged Crossbill	*Loxia leucoptera*	ND			
American Crow	*Corvus brachyrhynchos*	X		X	
Yellow-billed Cuckoo	*Coccyzus americanus*	ND			ST
Long-billed Curlew	*Numenius americanus*	X	X	X	SP/SD
American Dipper	*Cinclus mexicanus*	X		X	
Inca Dove	*Columbina inca*	X			
Mourning Dove	*Zenaida macroura*	X	X	X	TAKE
Rock Dove	*Columba livia*	X		X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Long-billed Dowitcher	*Limnodromus scolopaceus*	X		X	
Ring-necked Duck	*Aythya collaris*	X		X	TAKE
Ruddy Duck	*Oxyura jamaicensis*	X		X	TAKE
Wood Duck	*Aix sponsa*	X			TAKE
Dunlin	*Calidris alpina*	X			
Bald Eagle	*Haliaeetus leucocephalus*	X	X	X	FT
Golden Eagle	*Aquila chrysaetos*	X	X	X	
Cattle Egret	*Bubulcus ibis*	X			
Snowy Egret	*Egretta thula*	X	X	X	
Peregrine Falcon	*Falco peregrinus*	X	X	X	FE
Prairie Falcon	*Falco mexicanus*	X	X	X	
Cassin's Finch	*Carpodacus cassinii*	X	X	X	
House Finch	*Carpodacus mexicanus*	X	X	X	
Northern Flicker	*Colaptes auratus*	X	X	X	
Ash-throated Flycatcher	*Myiarchus cinerascens*	X	X	X	
Cordilleran (Western) Flycatcher	*Empidonax occidentalis*	X	X	X	
Dusky Flycatcher	*Empidonax oberholseri*	X	X	X	
Gray Flycatcher	*Empidonax wrightii*	X	X	X	
Hammond's Flycatcher	*Empidonax hammondii*	X			
Olive-sided Flycatcher	*Contopus borealis*	X	X		
Scissor-tailed Flycatcher	*Tyrannus forficatus*	X			
Vermilion Flycatcher	*Pyrocephalus rubinus*	X			
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	X	X	X	FE
Gadwall	*Anas strepera*	X	X	X	TAKE
Blue-gray Gnatcatcher	*Polioptila caerulea*	X	X	X	
Marbled Godwit	*Limosa fedoa*	X		X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Barrow's Goldeneye	*Bucephala islandica*	ND			TAKE
Common Goldeneye	*Bucephala clangula*	X		X	TAKE
American Goldfinch	*Carduelis tristis*	X	X	X	
Lesser Goldfinch	*Carduelis lawrencei*	X	X	X	
Canada Goose	*Branta canadensis*	X	X	X	TAKE
Greater White-fronted Goose	*Anser albifrons*	ND			TAKE
Ross's Goose	*Chen rossii*	ND			TAKE
Snow Goose	*Chen caerulescens*	X			
Northern Goshawk	*Accipiter gentilis*	X	X	X	SP
Common Grackle (possible)	*Quiscalus quiscula*	ND			
Clark's Grebe	*Aechmophorus clarkii*	X			
Eared Grebe	*Podiceps nigricollis*	X		X	
Horned Grebe	*Podiceps auritus*	ND			
Pied-billed Grebe	*Podilymbus podiceps*	X		X	
Western Grebe	*Aechmophorus occidentalis*	X		X	
Black-headed Grosbeak	*Pheucticus melanocephalus*	X	X	X	
Blue Grosbeak	*Guiraca caerulea*	X	X	X	SP/SD
Evening Grosbeak	*Coccothraustes vespertinus*	X	X	X	
Pine Grosbeak	*Pinicola enucleator*	X			
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	ND			
Blue Grouse	*Dendragapus obscurus*	X			TAKE
Ruffed Grouse	*Bonasa umbellus*	ND			TAKE
Sage Grouse	*Centrocercus urophasianus*	X			TAKE
Bonaparte's Gull	*Larus philadelphia*	X			
California Gull	*Larus californicus*	X	X	X	
Franklin's Gull	*Larus pipixcan*	X		X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Herring Gull	*Larus argentatus*	ND			
Ring-billed Gull	*Larus delawarensis*	X		X	
Northern Harrier	*Circus cyaneus*	X	X	X	
Cooper's Hawk	*Accipiter cooperii*	X	X	X	
Ferruginous Hawk	*Buteo regalis*	X	X	X	ST
Red-tailed Hawk	*Buteo jamaicensis*	X	X	X	
Rough-legged Hawk	*Buteo lagopus*	X	X	X	
Sharp-shinned Hawk	*Accipiter striatus*	X	X	X	
Swainson's Hawk	*Buteo swainsoni*	X	X	X	SP
Black-crowned Night-Heron	*Nycticorax nycticorax*	X	X	X	
Great Blue Heron	*Ardea herodias*	X	X	X	
Green Heron	*Butorides virescens*	X			
Black-chinned Hummingbird	*Archilochus alexandri*	X	X	X	
Broad-tailed Hummingbird	*Selasphorus platycercus*	X	X	X	
Calliope Hummingbird	*Stellula calliope*	X			
Rufous Hummingbird	*Selasphorus rufus*	X	X	X	
White-faced Ibis	*Plegadis chihi*	X	X	X	
Gray Jay	*Perisoreus canadensis*	ND			
Pinyon Jay	*Gymnorhinus cyanocephalus*	X	X	X	
Steller's Jay	*Cyanocitta stelleri*	X	X	X	
Western Scrub-Jay	*Aphelocoma californica*	X	X	X	
Dark-eyed Junco	*Junco hyemalis*	X	X	X	
American Kestrel	*Falco sparverius*	X	X	X	
Killdeer	*Charadrius vociferus*	X	X	X	
Cassin's Kingbird	*Tyrannus vociferans*	X	X	X	
Eastern Kingbird	*Tyrannus tyrannus*	X		X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Western Kingbird	*Tyrannus verticalis*	X	X	X	
Belted Kingfisher	*Ceryle alcyon*	X	X	X	
Golden-crowned Kinglet	*Regulus satrapa*	X		X	
Ruby-crowned Kinglet	*Regulus calendula*	X	X	X	
Red Knot	*Calidris canutus*	ND			
Horned Lark	*Eremophila alpestris*	X	X	X	
Chestnut-collared Longspur	*Calcarius ornatus*	ND			
Lapland Longspur	*Calcarius lapponicus*	ND			
Common Loon	*Gavia immer*	X		X	
Black-billed Magpie	*Pica pica*	X	X	X	
Mallard	*Anas platyrhynchos*	X	X	X	TAKE
Purple Martin	*Progne subis*	ND			
Western Meadowlark	*Sturnella neglecta*	X	X	X	
Common Merganser	*Mergus merganser*	X		X	TAKE
Hooded Merganser	*Lophodytes cucullatus*	X			TAKE
Red-breasted Merganser	*Mergus serrator*	X		X	TAKE
Merlin	*Falco columbarius*	X	X	X	
Northern Mockingbird	*Mimus polyglottos*	X	X	X	
Common Nighthawk	*Chordeiles minor*	X	X	X	
Clark's Nutcracker	*Nucifraga columbiana*	X	X	X	
Pygmy Nuthatch	*Sitta pygmaea*	X	X		
Red-breasted Nuthatch	*Sitta canadensis*	X	X	X	
White-breasted Nuthatch	*Sitta carolinensis*	X	X	X	
Oldsquaw	*Clangula hyemalis*	ND			TAKE
Bullock's Oriole	*Icterus bullockii*	X	X	X	
Scotts Oriole	*Icterus parisorum*	X	X	X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Osprey	*Pandion haliaetus*	X	X	X	SD
Barn Owl	*Tyto alba*	X		X	
Burrowing Owl	*Speotyto cunicularia*	X		X	SP
Flammulated Owl	*Otus flammeolus*	X		X	
Great Horned Owl	*Bubo virginianus*	X	X	X	
Long-eared Owl	*Asio otus*	X	X	X	
Northern Pygmy-Owl	*Glaucidium gnoma*	X	X	X	
Northern Saw-whet Owl	*Aegolius acadicus*	X	X	X	
Short-eared Owl	*Asio flammeus*	X			SP
Mexican Spotted Owl	*Strix occidentalis lucida*	X	X	X	FT
Western Screech-owl	*Otus kennicottii*	X			
American White Pelican	*Pelecanus erythrorhynchos*	X		X	SD
Phainopepla	*Phainopepla nitens*	X			
Red Phalarope	*Phalaropus fulicaria*	ND			
Red-necked Phalarope	*Phalaropus lobatus*	X		X	
Wilson's Phalarope	*Phalaropus tricolor*	X		X	
Ring-necked Pheasant	*Phasianus colchicus*	ND			TAKE
Black Phoebe	*Sayornis nigricans*	X			
Eastern Phoebe	*Sayornis phoebe*	X			
Say's Phoebe	*Sayornis saya*	X	X	X	
Band-tailed Pigeon	*Columba fasciata*	X			TAKE
Northern Pintail	*Anas acuta*	X		X	TAKE
American Pipit	*Anthus spinoletta*	X		X	
American Golden-Plover	*Pluvialis dominicus*	ND			
Black-bellied Plover	*Pluvialis squatarola*	X			
Semipalmated Plover	*Charadrius semipalmatus*	X			

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APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Snowy Plover	*Charadrius alexandrinus*	ND			
Common Poorwill	*Phalaenoptilus nuttallii*	X	X	X	
California Quail	*Callipepla californica*	ND			TAKE
Gambel Quail	*Callipepla gambelii*	X		X	TAKE
Virginia Rail	*Rallus limicola*	X			
Common Raven	*Corvus corax*	X	X	X	
Redhead	*Aythya americana*	X		X	TAKE
Common Redpoll	*Carduelis flammea*	ND			
American Redstart	*Setophaga ruticilla*	ND			
Greater Roadrunner	*Geococcyx californicus*	X			
American Robin	*Turdus migratorius*	X	X	X	
Sanderling	*Calidris alba*	X			
Baird's Sandpiper	*Calidris bairdii*	X			
Least Sandpiper	*Calidris minutilla*	X		X	
Pectoral Sandpiper	*Calidris melanotos*	X			
Semipalmated Sandpiper	*Calidris pusilla*	ND			
Solitary Sandpiper	*Tringa solitaria*	X			
Spotted Sandpiper	*Actitis macularia*	X	X	X	
Stilt Sandpiper	*Calidris himantopus*	ND			
Upland Sandpiper	*Bartramia longicauda*	ND			
Western Sandpiper	*Calidris mauri*	X		X	
Red-naped Sapsucker	*Sphyrapicus nuchalis*	X	X	X	
Williamson's Sapsucker	*Sphyrapicus thyroideus*	X			SD
Yellow-bellied Sapsucker	*Sphyrapicus varius*	ND			
Greater Scaup	*Aythya marila*	X			TAKE
Lesser Scaup	*Aythya affinis*	X		X	TAKE

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APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
White-winged Scoter	*Melanitta fusca*	ND			TAKE
Northern Shoveler	*Anas clypeata*	X		X	TAKE
Loggerhead Shrike	*Lanius ludovicianus*	X	X	X	
Northern Shrike	*Lanius excubitor*	X	X	X	
Pine Siskin	*Carduelis pinus*	X	X	X	
Common Snipe	*Gallinago gallinago*	X		X	TAKE
Townsend's Solitaire	*Myadestes townsendi*	X	X	X	
Sora	*Porzana carolina*	X			
American Tree Sparrow	*Spizella arborea*	X			
Black-chinned Sparrow	*Spizella atrogularis*	X			
Black-throated Sparrow	*Amphispiza bilineata*	X	X	X	
Brewer's Sparrow	*Spizella breweri*	X	X	X	
Chipping Sparrow	*Spizella passerina*	X	X	X	
Fox Sparrow	*Passerella iliaca*	X	X	X	
Golden-crowned Sparrow	*Zonotrichia querula*	X			
Harris's Sparrow	*Zonotrichia querula*	X			
House Sparrow	*Passer domesticus*	X	X	X	
Lark Sparrow	*Chondestes grammacus*	X	X	X	
Lincoln's Sparrow	*Melospiza lincolnii*	X		X	
Sage Sparrow	*Amphispiza belli*	X	X	X	
Savannah Sparrow	*Passerculus sandwichensis*	X		X	
Song Sparrow	*Melospiza melodia*	X	X	X	
Swamp Sparrow	*Melospiza georgiana*	X			
Vesper Sparrow	*Pooecetes gramineus*	X	X	X	
White-crowned Sparrow	*Zonotrichia leucophrys*	X	X	X	
White-throated Sparrow	*Zonotrichia albicollis*	X			

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
European Starling	*Sturnus vulgaris*	X	X	X	
Black-necked Stilt	*Himantopus mexicanus*	X		X	
Bank Swallow	*Riparia riparia*	X			
Barn Swallow	*Hirundo rustica*	X	X	X	
Cliff Swallow	*Hirundo pyrrhonota*	X	X	X	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	X	X	X	
Tree Swallow	*Tachycineta bicolor*	X	X	X	
Violet-green Swallow	*Tachycineta thalassina*	X	X	X	
Tundra Swan	*Cygnus columbianus*	X		X	TAKE
Black Swift	*Cypseloides niger*	ND			SP/SD
Vaux's Swift	*Chaetura vauxi*	ND			
White-throated Swift	*Aeronautes saxatalis*	X	X	X	
Western Tanager	*Piranga ludoviciana*	X	X	X	
Blue-winged Teal	*Anas discors*	X		X	TAKE
Cinnamon Teal	*Anas cyanoptera*	X	X	X	TAKE
Green-winged Teal	*Anas crecca*	X	X	X	TAKE
Black Tern	*Chlidonias niger*	X		X	SP
Caspian Tern	*Sterna caspia*	ND			SP
Common Tern	*Sterna hirundo*	ND			
Forster's Tern	*Sterna forsteri*	X		X	
Bendire's Thrasher	*Toxostoma bendirei*	X		X	
Sage Thrasher	*Oreoscoptes montanus*	X	X	X	
Hermit Thrush	*Catharus guttatus*	X	X	X	
Swainson's Thrush	*Catharus ustulatus*	X			
Varied Thrush	*Ixoreus naevius*	X			
Juniper Titmouse	*Parus inornatus*	X	X	X	

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APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Green-tailed Towhee	*Pipilo chlorurus*	X	X	X	
Spotted Towhee	*Pipilo maculatus*	X	X	X	
Merriam's Turkey	*Meleagris gallopavo*	X		X	TAKE
Rio Grande Turkey	*Meleagris gallopavo*	X	X	X	TAKE
Ruddy Turnstone	*Arenaria interpres*	ND			
Cassin's Vireo	*Vireo cassinii*	ND			
Gray Vireo	*Vireo vicinior*	X			
Plumbeous Vireo	*Vireo plumbeus*	X	X	X	
Red-eyed Vireo	*Vireo olivaceus*	ND			
Warbling Vireo	*Vireo gilvus*	X	X	X	
White-eyed Vireo	*Vireo griseus*			X	
Turkey Vulture	*Cathartes aura*	X	X	X	
Black-throated Gray Warbler	*Dendroica nigrescens*	X	X	X	
Grace's Warbler	*Dendroica graciae*	X	X		
Hermit Warbler	*Dendroica occidentalis*	ND			
Lucy's Warbler	*Vermivora luciae*	ND			
MacGillivray's Warbler	*Oporornis tolmiei*	X	X	X	
Nashville Warbler	*Vermivora ruficapilla*	X			
Orange-crowned Warbler	*Vermivora celata*	X		X	
Townsend's Warbler	*Dendroica townsendi*	X			
Virginia's Warbler	*Vermivora virginiae*	X	X	X	
Wilson's Warbler	*Wilsonia canadensis*	X	X	X	
Yellow Warbler	*Dendroica petechia*	X	X	X	
Yellow-rumped Warbler	*Dendroica coronata*	X	X	X	
Northern Waterthrush	*Seiurus noveboracensis*	ND			
Bohemian Waxwing	*Bombycilla garrulus*	X			

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Cedar Waxwing	*Bombycilla cedrorum*	X		X	
Whimbrel	*Numenius phaeopus*	ND			
American Wigeon	*Anas americana*	X	X	X	TAKE
Willet	*Catoptrophorus semipalmatus*	X			
Acorn Woodpecker	*Melanerpes formicivorus*	ND			
Downy Woodpecker	*Picoides pubescens*	X	X	X	
Hairy Woodpecker	*Picoides villosus*	X	X	X	
Lewis' Woodpecker	*Melanerpes lewis*	X	X	X	SP/SD
Red-headed Woodpecker	*Melanerpes erythrocephalus*	ND			
Western Wood-pewee	*Contopus sordidulus*	X	X	X	
Bewick's Wren	*Thryomanes bewickii*	X	X	X	
Canyon Wren	*Catherpes mexicanus*	X	X	X	
House Wren	*Troglodytes aedon*	X	X	X	
Marsh Wren	*Cistothorus palustris*	X		X	
Rock Wren	*Salpinctes obsoletus*	X	X	X	
Winter Wren	*Troglodytes troglodytes*	X		X	
Greater Yellowlegs	*Tringa melanoleuca*	X		X	
Lesser Yellowlegs	*Tringa flavipes*	X		X	
Common Yellowthroat	*Geothlypis trichas*	X		X	SP
Fish Species					
Largemouth Bass	*Micropterus salmoides*			X	TAKE
Smallmouth Bass	*Micropterus dolomieui*			X	TAKE
Bluegill	*Lepomis macrochirus*			X	TAKE
Carp	*Cyprinus carpio*			X	
Channel Catfish	*Ictalurus punctatus*			X	TAKE
Roundtail Chub	*Gila robusta*			X	ST

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APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Speckled Dace	*Rhinichthys osculus*			X	
Fathead Minnow	*Pimephales promelas*			X	
Mottled Sculpin	*Cottus bairdi*			X	
Red Shiner	*Notropis lutrensis*			X	
Bluehead Sucker	*Catostomus discobolus*			X	SP
Flannelmouth Sucker	*Catostomus latipinnis*			X	SP
Mountain Sucker	*Pantosteus platyrhynchus*			X	
Green Sunfish	*Lepomis cyanellus*			X	
Brook Trout	*Salvelinus fontinalis (Mitchill)*			X	TAKE
Brown Trout	*Salmo trutta*			X	TAKE
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*			X	TAKE
Rainbow Trout	*Oncorhynchus mykiss*			X	TAKE
Tiger Trout	*Salmo trutta X Salvelinus fontinalis*			X	TAKE
Yellowstone Cutthroat Trout	*Salmo clarki bouvieri*			X	TAKE
Mammal species					
American Badger	*Taxidea taxus*	X	X	X	TAKE
Allen's Big-eared Bat	*Idionycteris phyllotis*	X	X		SD
Big Brown Bat	*Eptesicus fuscus*	X	X	X	
Big Free-tailed Bat	*Nyctinomops macrotis*	X	X	X	SP/SD
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	X	X	X	SP/SD
Hoary Bat	*Lasiurus cinereus*	X	X	X	
Pallid Bat	*Antrozous pallidus*	X	X	X	
Silver-haired Bat	*Lasionycteris noctivagans*	X	X	X	
Spotted Bat	*Euderma maculatum*	X	X	X	SP
Townsend's Big-eared Bat	*Corynorhinus townsendii*	X	X	X	SP/SD
Western Red Bat	*Lasiurus blossevilli*	X	X	X	SP/SD

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APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Black Bear	*Ursus americanus*	X	X	X	TAKE
American Beaver	*Castor canadensis*	X		X	TAKE
Bobcat	*Lynx rufus*	X	X	X	TAKE
Ringtail Cat	*Bassariscus astutus*	X	X	X	TAKE
Cliff Chipmunk	*Tamias dorsalis*	X	X	X	
Colorado Chipmunk	*Tamias quadrivittatus*	X	X	X	
Least Chipmunk	*Tamias minimus*	X	X	X	
Uinta Chipmunk (inlcudes Mt. Ellen race)	*Tamias umbrinus (includes sedulus)*	ND			
Coyote	*Canis latrans*	X	X	X	
Mule Deer	*Odocoileus hemionus*	X	X	X	TAKE
Rocky Mountain Elk	*Cervus elaphus nelsoni*	X	X	X	TAKE
Ermine	*Mustela erminea*	ND			
Gray Fox	*Urocyon cinereoargenteus*	X	X	X	TAKE
Kit Fox	*Vulpes velox*	ND			TAKE
Red Fox	*Vulpes vulpes*	ND			TAKE
Botta's Pocket Gopher	*Thomomys bottae (includes dissimilis)*	X	X	X	
Northern Pocket Gopher	*Thomomys talpoides*	X	X		
Snowshoe Hare	*Lepus americanus*	ND			TAKE
Black-tailed Jackrabbit	*Lepus californicus*	X	X	X	
Desert Cottontail Rabbit	*Sylvilagus audubonii*	X	X	X	TAKE
Mountain Cottontail Rabbit	*Sylvilagus nuttallii*	X			TAKE
White-tailed Jackrabbit	*Lepus townsendii*	ND			
Mountain Lion	*Felis concolor*	X	X	X	TAKE
Yellow-bellied Marmot	*Marmota flaviventris*	X			
Mink	*Mustela vison*			X	TAKE
Brush Mouse	*Peromyscus boylii*	X	X	X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Canyon Mouse	*Peromyscus crinitus*	X	X	X	
Deer Mouse	*Peromyscus maniculatus*	X	X	X	
Great Basin Pocket Mouse	*Perognathus parvus*	ND			
House Mouse	*Mus musculus*	X	X	X	
Little Pocket Mouse	*Perognathus longimembris*	ND			
Long-tailed Pocket Mouse	*Perognathus formosus*	X	X	X	
Northern Grasshopper Mouse	*Onychomys leucogaster*	X	X	X	
Northern Rock Mouse	*Peromyscus nasutus*	ND			SP/SD
Pinyon Mouse	*Peromyscus truei*	X	X	X	
Rock Pocket Mouse	*Chaetodipus intermedius*	ND			SD
Western Harvest Mouse	*Reithrodontomys megalotis*	X	X	X	
Western Jumping Mouse	*Zapus princeps*	ND			
Muskrat	*Ondatra zibethicus*	X	X	X	
California Myotis	*Myotis californicus*	X	X	X	
Fringed Myotis	*Myotis thysanodes*	X	X	X	SD
Little Brown Myotis	*Myotis lucifugus*	ND			
Long-eared Myotis	*Myotis evotis*	X		X	
Long-legged Myotis	*Myotis volans*		X	X	
Western Small-footed Myotis	*Myotis ciliolabrum*	X	X	X	SD
Yuma Myotis	*Myotis yumanensis*	X	X	X	
Northern River Otter	*Lutra canadensis*	ND			SP/SD
American Pika	*Ochotona princeps*	ND			SD
Western Pipistrelle	*Pipistrellus hesperus*	X	X	X	
Common Porcupine	*Erethizon dorsatum*	X	X	X	
Pronghorn	*Antilocapra americana*		X		TAKE
Raccoon	*Procyon lotor*	X	X	X	

APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Black Rat	*Rattus rattus*	ND			
Norway Rat	*Rattus norvegicus*	ND			
Ord's Kangaroo Rat	*Dipodomys ordii*	X	X	X	
Desert Bighorn Sheep	*Ovis canadensis nelsoni*	X	X	X	TAKE
Desert Shrew	*Notiosorex crawfordi*	ND			SD
Masked Shrew	*Sorex cinereus*	ND			
Merriams Shrew	*Sorex merriami*	ND			
Montane Shrew	*Sorex monticolus*	ND			
Preble's Shrew	*Sorex preblei*	ND			
Vagrant Shrew	*Sorex vagrans*	ND			
Water Shrew	*Sorex palustris*		X		
Striped Skunk	*Mephitis mephitis*	X	X	X	TAKE
Western Spotted Skunk	*Spilogale gracilis*	X	X	X	TAKE
Golden-mantled Ground Squirrel	*Spermophilus lateralis*	X	X		
Nothern Flying Squirrel	*Glaucomys sabrinus*	ND			SD
Red Squirrel	*Tamiasciurus hudsonicus*	X	X		
Rock Squirrel	*Spermophilus variegatus*	X	X	X	
White-tailed Antelope Squirrel	*Ammospermophilus leucurus*	X	X	X	
Heather Vole	*Phenacomys intermedius*	ND			
Long-tailed Vole	*Microtus longicaudus*	X	X	X	
Mexican Vole	*Microtus mexicanus*	ND			SP/SD
Montane Vole (includes Virgin R.)	*Microtus montanus (includes rivularis)*	X			SP/SD
Sagebrush Vole	*Lemmiscus curtatus*	ND			
Water Vole	*Microtus richardsoni*	ND			
Long-tailed Weasel	*Mustela frenata*	X	X	X	TAKE
Bushy-tailed Woodrat	*Neotoma cinerea*	X	X	X	

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SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Desert Woodrat	*Neotoma lepida*	X	X	X	
Stephens' Woodrat	*Neotoma stephensi*	ND			SP/SD
Reptile species					
Rubber Boa	*Charina bottae*	ND			
Glen Canyon Chuckwalla	*Sauromalus obesus multiforaminatus*		X	X	SP/SD
Red Coachwhip	*Masticophis flagellum piceus*	ND			
California Kingsnake	*Lampropeltis getula californiae*	X	X	X	SD
Utah Mountain Kingsnake	*Lampropeltis pyromelana infralabialis*	X			SP
Pale Leopard Lizard	*Gambelia wislizenii punctatus*	X	X	X	
Northern Plateau Lizard	*Sceloporus undulatus elongatus*	X	X	X	
Northern Sagebrush Lizard	*Sceloporus graciosus graciosus*	X	X	X	
Northern Tree Lizard	*Urosaurus ornatus*	X	X		
Orangehead Spiny Lizard	*Sceloporus magister cephaloflavus*	X	X	X	
Short-horned Lizard	*Phrynosoma douglassi*	X	X	X	
Side-blotched Lizard	*Uta stansburiana*	X	X	X	
Southern Desert Horned Lizard	*Phrynosoma platyrhinos calidiarum*	ND			
Yellow-headed collared lizard	*Crotaphytus collaris auriceps*	X	X	X	
Utah Night Lizard	*Xantusia vigilis utahensis*			X	SD
Western Yellow-bellied Racer	*Coluber constrictor mormon*	ND			
Great Basin Rattlesnake	*Crotalus viridis ? lutosus*	X	X	X	
Hopi Rattlesnake	*Crotalus viridis nuntius*			X	
Midget-faded Rattlesnake	*Crotalus viridis concolor*		X	X	
Great Basin Skink (no records)	*Eumeces skiltonianus utahensis*	X	X	X	
Southwestern Black-headed Snake	*Tantilla hobartsmithi*		X		SD
Black-necked Garter Snake	*Thamnophis cyrtopsis cyrtopsis*			X	
Wandering Garter Snake	*Thamnophis elegans vagrans*	X	X	X	

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APPENDIX 15 - WILDLIFE SPECIES

SPECIES COMMON NAME	SCIENTIFIC NAME	GEOGRAPHIC AREA			SOSC
		GS	KP	EC	
Painted Desert Glossy Snake	*Arizona elegans philipi*	X	X		SD
Great Basin Gopher Snake	*Pituophis melanoleucus deserticola*	X	X	X	
Western Longnose Snake	*Rhinocheilus lecontei lecontei*	X	X	X	
Utah Milk Snake	*Lampropeltis triangulum taylori*	ND			SP
Desert Night Snake	*Hypsiglena torquata deserticola*	X			
Mojave Patch-nosed Snake	*Salvadora hexalepis*	X	X		SD
Regal Ringneck Snake	*Diadophis punctatus regalis*	X			
Western Painted Turtle (non native)	*Chrysemys picta belli*	ND			
Desert Striped Whipsnake	*Masticophis taeniatus taeniatus*	X	X	X	
Great Basin Whiptail	*Cnemidophorus tigris tigris*	ND			
Painted Desert Whiptail	*Cnemidophorus tigris septentrionalis*	ND			
Plateau Striped Whiptail	*Cnemidophorus velox*	X	X	X	SP/SD

Geographic Areas:
- **GS** Grand Staircase
- **KP** Kaiparowits Plateau
- **EC** Escalante Canyons

Species of Special Concern (SOSC):
- **ND** No Data (but could occur)
- **FE** (Federally listed as Endangered)
- **FC** (Federally listed as Candidate)
- **SE** (State Endangered Species)
- **ST** (State Threatened Species)
- **SP** (Species of Special Concern Population Decline)
- **SD** (Species of Special Concern Specialized Habitat)
- **SP/SD** (Species of Special Concern Population and Habitat Decline)
- **TAKE** (Species that have seasons for hunting or fishing set by the Utah Wildlife Board)

APPENDIX 15 - WILDLIFE SPECIES

TABLE A15.2
INVERTRABRATES FOUND IN GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

INVERTEBRATE GROUP	GEOGRAPHIC AREA[1]		
	GS	KP	EC
Mollusks	7	6	13
Scorpions	2	5	3
Spiders	1	51	38
Mites and Ticks	3	1	1
Pseudo Scorpions	1	0	0
Centipedes and Millipedes	0	0	3
Mayflies	0	6	6
Dragonflies and Damselflies	22	17	10
Grasshoppers and Relatives	6	13	15
Stone Flies	0	1	0
True Bugs	6	8	17
Cicadas, Aphids, and Relatives	12	1	15
Nerve-Winged Insects	10	1	1
Beetles	28	74	54
Caddisflies	0	3	5
Butterflies and Moths	4	0	0
Flies	56	12	24
Fleas	13	0	0
Wasps, Ants, and Bees	136	39	121

1 Number of species found in each geographic area

Geographic Areas:
- **GS** Grand Staircase
- **KP** Kaiparowits Plateau
- **EC** Escalante Canyons

Appendix 16

Utah Sensitive Wildlife Species

APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

INTRODUCTION

The Purpose the Utah Sensitive Species list is to identify those species in the state that are the most vulnerable to population or habitat loss. This list provides land managers, wildlife managers and concerned citizens with a brief overview of the conservation status of listed species. By developing and implementing timely and sufficient conservation measures for Sensitive Species, federal listing of these species under the Endangered Species Act may be precluded.

DEFINITIONS

A. **Wildlife**, for the purposes of this list, includes all vertebrate animals; crustaceans, including brine shrimp and crayfish; and mollusks in Utah that are living in nature, except feral animals.

B. **Extinct Species:** any wildlife species that has disappeared in the world.

C. **Extirpated Species:** any wildlife species that has disappeared from Utah since 1800.

D. **State Endangered Species:** any wildlife species or subspecies which is threatened with extirpation from Utah or extinction resulting from very low or declining numbers, alteration and/or reduction of habitat, detrimental environmental changes, or any combination of the above. Continued long-term survival is unlikely without implementation of special measures. A management program is needed for these species if a Recovery Plan has not been developed.

E. **State Threatened Species:** any wildlife species or subspecies which is likely to become an endangered species within the foreseeable future throughout all or a significant part of its range in Utah or the world. A management program is needed for these species if a Recovery Plan has not been developed.

F. **Species of Special Concern:** any wildlife species or subspecies that: has experienced a substantial decrease in population, distribution and/or habitat availability **(SP)**, or occurs in limited areas and/or numbers due to a restricted or specialized habitat **(SD)**, or has both a declining population and a limited range **(SP/SD)**. A management program, including protection or enhancement, is needed for these species.

G. **Conservation Species:** any wildlife species or subspecies, except those species currently listed under the Endangered Species Act as Threatened or Endangered, that meets the state criteria of Endangered, Threatened or of Special Concern, but is currently receiving sufficient special management under a Conservation Agreement developed and/or implemented by the State to preclude its listing above. In the event that the conservation agreement is not implemented, the species will be elevated to the appropriate category.

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APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

TABLE A16.1
SENSITIVE BIRD SPECIES FOUND WITHIN THE MONUMENT

BIRD SPECIES	AGENCY LISTING				
	Utah Division of Wildlife Resources	**United States Fish and Wildlife Service**	**United States Forest Service**	**Utah Natural Heritage Program**	**Bureau of Land Management**
Condor, California (*Gymnogyps californianus*)	SD	ENE		SX	S
Curlew, Long-billed (*Numenius americanus*)	SP/SD			S3B	S
Eagle, Bald (*Haliaeetus leucocephalus*)	T	T	T	S1B, S3N	S
Falcon, Peregrine (*Falco peregrinus anatum*)	E	E	E	S2	S
Flycatcher, Southwestern Willow (*Empidonax traillii extimus*)	E	E	S	S1B	S
Goshawk, Northern (*Accipiter gentilis atricapillus*)	SP		S	S3	S
Grosbeak, Blue (*Guiraca caerulea*)	SP/SD			S3S4B	S
Grouse, Sage (*Centrocercus urophasianus*)	SP/SD			S2S3	S
Hawk, Ferruginous (*Buteo regalis*)	T			S2N, S2S3B	S
Hawk, Swainson's (*Buteo swainsoni*)	SP			S3B, SRN	S
Osprey (*Pandion haliaetus*)	SD			S1S2B	S
Owl, Burrowing (*Athene cunicularia hypugaea*)	SP			S3B	S
Owl, Short-eared (*Asio flammeus flammeus*)	SP			S2S3	S
Owl, Mexican Spotted (*Strix occidentalis lucida*)	T	T	S	S1	S
Pelican, American White (*Pelecanus erythrorhynchos*)	SD			S2B	S
Sapsucker, Williamson's (*Sphyrapicus thyroideus*)	SD			S2S3B, SAN	S
Tern, Black (*Chlidonias niger*)	SP			S2S3B	S
Tern, Caspian (*Sterna caspia*)	SP			S1B	S
Woodpecker, Lewis' (*Melanerpes lewis*)	SP/SD			S2S3	S
Yellowthroat, Common (*Geothlypis trichas*)	SP			S3B	S

APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

TABLE A16.2

SENSITIVE MAMMAL SPECIES FOUND WITHIN THE MONUMENT

MAMMAL SPECIES	AGENCY LISTING				
	Utah Division of Wildlife Resources	United States Fish and Wildlife Service	United States Forest Service	Utah Natural Heritage Program	Bureau of Land Management
Bat, Allen's Big-eared (*Idionycteris phyllotis*)	SD			S1	S
Bat, Big Free-tailed (*Nyctinomops macrotis*)	SP/SD			S2	S
Bat, Brazilian Free-tailed (*Tadarida brasiliensis mexicana*)	SP/SD			S3S4	S
Bat, Spotted (*Euderma maculatum*)	SP		S	S2	S
Bat, Townsend's Big-eared (*Plecotus townsendii*)	SP/SD		S		S
Bat, Western Red (*Lasiurus blossevillii*)	SP/SD			S1	S
Myotis, Fringed (*Myotis thysanodes*)	SD			S3	S
Myotis, Western Small-footed (*Myotis ciliolabrum*)	SD			S3S4	S
Ringtail (*Bassariscus astutus*)	SD			S4	S
Vole, Virgin River Montane (*Microtus montanus rivularis*)	SP/SD			S2	S

APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

TABLE A16.3

SENSITIVE FISH SPECIES FOUND WITHIN THE MONUMENT

FISH SPECIES	AGENCY LISTING				
	Utah Division of Wildlife Resources	United States Fish and Wildlife Service	United States Forest Service	Utah Natural Heritage Program	Bureau of Land Management
Chub, Roundtail (*Gila robusta*)	T			S2	S
Squawfish, Colorado (*Ptychocheilus lucius*)	E	E		S1	S
Sucker, Bluehead (*Catostomus discobolus*)	SP			S4	S
Sucker, Flannelmouth (*Catostomus latipinnis*)	SP			S3S4	S
Sucker, Razorback (*Xyrauchen texanus*)	E	E		S1	S
Trout, Colorado River Cutthroat (*Oncorhynchus clarki*)	CS		S	S2	S

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APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

TABLE A16.4

SENSITIVE AMPHIBIAN SPECIES FOUND WITHIN THE MONUMENT

AMPHIBIAN SPECIES	AGENCY LISTING				
	Utah Division of Wildlife Resources	United States Fish and Wildlife Service	United States Forest Service	Utah Natural Heritage Program	Bureau of Land Management
Toad, Arizona (*Bufo microscaphus microscaphus*)	SP			S2	S

TABLE A16.5

SENSITIVE REPTILE SPECIES FOUND WITHIN THE MONUMENT

REPTILE SPECIES	AGENCY LISTING				
	Utah Division of Wildlife Resources	United States Fish and Wildlife Service	United States Forest Service	Utah Natural Heritage Program	Bureau of Land Management •
Chuckwalla, Glen Canyon (*Sauromalus obesus multiforaminatus*)	SP/SD			S2	S
Kingsnake, California (*Lampropeltis getula californiae*)	SD			S3	S
Kingsnake, Utah Mountain (*Lampropeltis pyromelana infralabialis*)	SP			S2S3	S
Lizard, Desert Night (*Xantusia vigilis vigilis*)	SD			S2S3	S
Lizard, Utah Night (*Xantusia vigilis utahensis*)	SD			S2S3	S
Snake, Mojave Patch-nosed (*Salvadora hexalepis mojavensis*	SD			S2S3	S
Snake, Painted Desert Glossy (*Arizona elegans philipi*)	SD			S2	S
Snake, Southwestern Black-headed (*Tantilla hobartsmithi*)	SD			S2	S
Whiptail, Plateau Striped (*Cnemidophorus velox*)	SP/SD			S3	S

APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

Utah Division of Wildlife Resources and Utah Natural Heritage Program definition of ranks:

S1	critically imperiled	SH	historical	SR	reported	S#S#	rank range
S2	imperiled	SX	extirpated	SRF	reported falsely		
S3	rare or uncommon	SE	exotic, introduced	SZ	zero occurrences		
S4	common	SA	accidental	-B	breeding rank		
S5	abundant and secure	SP	potential	-N	non-breeding rank		

As defined in the Natural Heritage Program Operations Manual, a numeric rank (1 through 5) is assigned to indicate the status of a species at both the Global (rangewide) level and at the State level. These ranks are based primarily on the number of occurrences of the species, along with other factors such as overall abundance, extent of geographic range, population trends, and threats. The range in number of occurrences suggested for each numeric rank below is not an absolute guideline, but only the starting point in the ranking process.

G1 or **S1** Indicates extreme rarity or other factor(s) making the species especially vulnerable to extinction or extirpation (typically 5 or fewer occurrences or very few remaining individuals or acres).

G2 or **S2** Indicates rarity or other factor(s) making the species very vulnerable to extinction or extirpation (6 to 20 occurrences or few remaining individuals or acres).

G3 or **S3** Indicates a species that is either very rare and local throughout its range or found locally (even abundantly at some of its locations) within a restricted range, or vulnerable to extinction or extirpation because of other factors (21 to 100 occurrences).

G4 or **S4** Indicates a species that is widespread, abundant, and apparently secure, though it may be quite rare in parts of its range, especially at the periphery (usually more than 100 occurrences).

G5 or **S5** Indicates a species that is demonstrably widespread, abundant, and secure, though it may be quite rare in parts of its range.

A range spanning two (or even three) of the numeric ranks denotes a range of uncertainty about the exact status of the species (e.g., **S1S2**); ranges cannot skip more than one rank (e.g., **S1S4** is not allowed). Global ranks for infraspecific taxa (races or subspecies in the case of animals) consist of the G-rank for the full species plus a **T** followed by a numerical rank, which is the global rank of the infraspecific taxon. A qualifier of **?** also may be added to a rank to denote the rank as inexact; a qualifier of **Q** indicates that the validity of the taxon is questionable.

APPENDIX 16 - UTAH SENSITIVE WILDLIFE SPECIES

As more information is gathered, some species are added to the tracking list and some are dropped from the list. Our increasing understanding allows the ranks to be reevaluated and adjusted periodically.

Additional possible Natural Heritage ranks include:

GH or SH Historical: Of historical occurrence throughout its range, i.e., formerly part of the established biota, with the expectation that it may be rediscovered (e.g., relict leopard frog).

GX or SX Extinct (Global) or extirpated (State): Believed to be extinct throughout its range or extirpated in the state with virtually no likelihood that it will be rediscovered.

SE	Exotic in the state
SA	Accidental in the state
SZ	Zero occurrences (in most cases this implies that the species is migratory through the state)
SP	Potential occurrence in the state but as yet undocumented
SR	Reported in the state, but occurrence questionable
SRF	Reported falsely in the state

An extension of the above basic ranks may be assigned to denote breeding and non-breeding status (**rank + B** for breeding status, **rank + N** for non-breeding status, especially useful for many birds, some bats, and other animals that move into or out of the state seasonally).

Appendix 17

Deer and Elk Herd Unit Management Plans

APPENDIX 17 - DEER AND ELK HERD UNIT MANAGEMENT PLANS

TABLE A17.1
DEER AND ELK HERD UNIT MANAGEMENT PLANS[1]

UNIT MANAGEMENT PLAN	TARGET WINTER HERD SIZE	HERD COMPOSITION
Plateau - Elk Herd Unit #25 Sub-unit #25-c Boulder	modeled population of 1,500 post season and winter count of 1,250	A minimum post season bull to cow ratio of 8:100, with at least 4 of these bulls being 2 ½ years of age or older.
Kaiparowits - Elk Herd Unit #26	up to 25 elk	Allowed to use during the winter
Paunsaugunt - Elk Herd Unit #27	200 elk	A minimum post season bull to cow ratio of 16:100, with at least 8 of these bulls being 2 ½ years of age or older. Bull Harvest Objective - Provide opportunity for a 60% bull harvest success with 40% of the bulls harvested being 2 ½ years or older.
Plateau - Deer Herd Unit #25 Sub-unit #25-c	8,500 wintering deer	A post season buck to doe ratio of 15:100, with 30% of these bucks being three point or better.
Kaiparowits - Deer Herd Unit #26	1,200 wintering deer (modeled number)	A post season buck to doe ratio of 15:100, with 30% of these bucks being three point or better.
Paunsaugunt - Deer Herd Unit #27	target population size of 6,500 wintering deer (modeled number)	A post season buck to doe ratio of 30:100, with 50% of these bucks being three point or better.

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[1] Deer and Elk Herd unit Management Plans passed by the Utah Wildlife Board April 23, 1998

Appendix 18

Special Management Areas

APPENDIX 18 - SPECIAL MANAGEMENT AREAS

SPECIAL MANAGEMENT AREAS UNDER THE CLASSIFICATION AND MULTIPLE USE ACT

Outstanding Natural Areas (ONA), Recreation Areas, and Historic Sites were created under the authority of the Classification and Multiple Use Act (CMU) of 1964. Originally these classifications were to expire, but FLPMA provided for the continuation of all classifications and withdrawals made under the CMU Act. Under FLPMA, the classifications and withdrawals made under the CMU Act and other existing designations are to be reviewed as a part of planning and a recommendation made regarding continuing these designations. The Secretary reserves the authority to modify or terminate the classification consistent with the land use plan. In this plan, we would recommend the continuation of all existing designations.

Provisions of 43 CFR 6225.0-5 of that era define Outstanding Natural Areas as follows:

> "*Outstanding natural areas.* These are established to preserve scenic values and areas of natural wonder. The preservation of these resources in their natural condition is the primary management objective. Access roads, parking areas, and public use facilities are normally located on the periphery of the area. The public is encouraged to walk into the area for recreation purposes wherever feasible."

A notice in the Federal Register in 1970 designated the following areas as ONAs, recreation areas or sites, or historic sites. The notice segregated the Escalante Canyons ONA, Devils Garden ONA, Calf Creek Recreation Area, Deer Creek Recreation Site, and Dance Hall Rock Historic Site from all forms of entry, location, or selection under the public land laws, including the general mining laws, but not the mineral leasing laws. They were also segregated from oil and gas exploration to the extent that notices of intent to explore require the approval of the Manager before operations commence. Phipps-Death Hollow, North Escalante Canyon, and the Gulch ONAs were segregated only from appropriation under the agricultural land laws and from sales under section 2455 of the Revised Statutes.

In 1972, Glen Canyon National Recreation Area was established and the public lands it encompassed were transferred to the National Park Service for management. This eliminated the majority of the Escalante Canyons ONA (originally 129,000 acres) but left five scattered tracts totaling 1,160 acres.

The ONAs became Instant Study Areas as part of the Wilderness Inventory process beginning in 1979. Interim Management Policy has applied to these areas since that time and will continue until Congress acts to designate or release these areas from study.

Later in 1979, off-road-vehicle closures were made on the ONAs, and on Calf Creek and Deer Creek Recreation Areas, as well as some other areas of concern under the authority of Executive Order 11644.

Devils Garden ONA, and both Deer Creek and Calf Creek Recreation Areas have management plans dating from the 1970s. The management prescriptions for Dance Hall Rock and the other ONAs include segregation from the land and mineral laws and off-highway vehicle closures.

It is recommended that the following ONAs, Recreation Areas and Historic sites designated under the authority of the CMU Act be continued:

- Calf Creek Recreation Area
- Deer Creek Recreation Site
- Devils Garden Outstanding Natural Area
- Dance Hall Rock Historic Site
- Escalante Canyons Outstanding Natural Area (tracts 2, 3, 4 are included in North Escalante Canyon/The Gulch ISA and Tract 1 and 5 are separate)
- North Escalante Canyon Outstanding Natural Area
- The Gulch Outstanding Natural Area

- Phipps-Death Hollow Outstanding Natural Area

No Mans Mesa

On September 18, 1986, a Federal Register Notice announced the designation of No Mans Mesa as a Research Natural Area (RNA) under the authority of 43 CFR 8200 and using a plan amendment.

The management prescription included designating 1,335 acres of public land as an RNA. Management was to give primary emphasis to educational, scientific, and research values. Management prescriptions included restricting off-highway vehicles to existing roads and trails, placement of a "no surface occupancy" stipulation on oil and gas leases, a requirement that the area be retained in public ownership, withdrawal of the RNA from mineral entry, completion of a management plan, and provision for determination of fire suppression on a case-by-case basis.

No subsequent management plan has been written. Since the Monument Proclamation, mineral recommendations and the retention objective have been superseded.

It is recommended that the RNA designation continue.

Wolverine Petrified Wood Area

Wolverine Petrified Wood Natural Environmental Area (2,560 acres) was withdrawn in 1960 from all forms of appropriation under the public land laws, including the mining, but not the mineral leasing laws. This withdrawal was continued and modified in 1982 and the area withdrawn was reduced to 1,520 acres as the minimum needed for protection. At that time the area was referred to as the Wolverine Petrified Wood Area. In 1981, 2,560 acres were closed to off-road-vehicle use.

It is recommended that this designation continue.

Appendix 19

Economic Conditions

APPENDIX 19 - ECONOMIC CONDITIONS

INTRODUCTION

The creation of Grand Staircase-Escalante National Monument in September 1996 brought with it a commitment from both the Federal and Utah State government administrations to make the resulting management planning process both unique and innovative. One result of that commitment is the involvement of state economists in the preparation of the required socio-economic analysis.

The *Grand Staircase - Escalante National Monument Socio-Economic Analysis* was prepared by the Utah Governor's Office of Planning and Budget in August 1998. It was commissioned by the BLM to facilitate the evaluation of the socio-economic impacts of the alternatives described in the Draft Management Plan/EIS.

The Utah Governor's Office of Planning and Budget analysis identified the direct, indirect and induced employment impacts of the alternatives using the base period 1995 Utah Multi-Regional Input-Output (UMRIO-95) model of southwest Utah and assumptions provided by the Monument Planning Team. These assumptions and estimates were then analyzed using the Utah Process Economic and Demographic Model, which provided population impacts. A Fiscal Impact Model was then used to generate fiscal impacts.

This appendix describes key background data used in the analysis.

ASSUMPTIONS

The BLM provided a series of basic assumptions for the socio-economic research and analysis conducted for this Draft Plan/EIS.

Some key assumptions include:

- Direct BLM spending will remain constant across all alternatives, and will stay level except for facility design and construction costs in 1999-2001.
- Direct BLM employment will also remain constant across all alternatives, totaling approximately 75 full time equivalents, with 30 being newly-created jobs.
- Major monument facilities will not change across alternatives, and will include a Headquarters in Kanab, a Visitor's Center and offices in Escalante, Visitor Contact Stations in Cannonville, Glendale, and Big Water, and the existing Contact Stations at Paria and the Anasazi State Park in Boulder.
- The BLM Monument Planning Team provided a series of assumptions regarding anticipated future levels of motorized use, scenic driving, mountain biking, backpacking, and car camping for each alternative, which are the building blocks for much of the analysis.

Research and analysis conducted by the Governor's Office of Planning and Budget resulted in the following assumptions:

- Visitation of 207,382 visitor days in 1997 serves as the base for projecting future recreation use.
- A baseline visitation projection was developed using a constant growth rate of 4.25 percent, which corresponds to other southern Utah destinations.
- The 1997 breakdown of visitor activities in the Monument is the basis of future use projections (backpacking, 40 percent; camping, 15 percent; hunting, 11 percent, hiking, 4 percent, driving, 8 percent, other, 22 percent)
- Visitor spending is approximately $20 per day.

FINDINGS

The socio-economic analysis considered impacts to four major areas: (1) Population; (2) Employment; (3) Earnings; and (4) Net Revenues to Local Governments.

APPENDIX 19 - ECONOMIC CONDITIONS

Key findings of the analysis include:

Population

Overall impacts to the southwestern Utah population base are relatively small. The various management alternatives could add between six and 544 persons to a total population base of 212,603 in the year 2012. Peak population impacts occur in the year 2000, during construction of the new Monument facilities, when the additional population base could range between 554 and 961. After construction activities cease, population increases attributable to the Monument would range between a loss of 10 to a gain of 28, depending upon the alternative considered.

Employment

Employment attributable to Monument activities is expected to peak during facility construction in the year 2000, when Monument activities could add between 351 and 615 jobs to an employment base of 74,457 in southwestern Utah. Total employment impacts attributable to the Monument in the year 2012 range from -1 to 248 added to a total employment base of 116,129. After construction activities cease, employment increases attributable to the Monument would range between a loss of 10 jobs to a gain of 18 jobs annually, depending upon the alternative considered.

Earnings

For the most part, unchanging direct employment by BLM results in a fairly steady earning stream throughout the study period analyzed. However, during facility construction the highest earnings are generated, ranging from $10.8 million to $18.4 million in the year 2000, depending upon the alternative considered. After construction, earnings stay quite steady, ranging between $1.4 million and $7.9 million in the year 2012.

Net Revenues to Local Governments

Net revenues to local governments remain relatively small, again with the construction activities in the year 2000 providing the peak revenue stream. In 2000, net revenues could range between $351,000 and $565,000. Because this item is so dependent upon projected visitation numbers, the assumptions made for the various alternatives produce a wide range of results by the year 2012, when net revenues range between a loss of $36,000 to a positive $330,000. This is again a very small proportion of expected local government revenues which total in the tens of millions of dollars.

Conclusions

All proposed management alternatives are driven by a basic intent to keep most of the landscape in its current condition, with very little new development expected. The steady operating budget, constant employee base, and fixed facility locations result in little variation between alternatives and over time. Overall, the impacts to the management alternatives are small. Impacts to local government revenues and expenditures are also relatively small.

The following tables and graphs provide specific information:

A19.3-4 Economic, Demograpic and Fiscal Impacts to the Soutwest Region
A19.5 Bureau of the Census Sub-county Population Estimates, 1990-1996
A19.6 Projection of Population by City in Garfield and Kane Counties
A19.7 Economic and Demographic Projections Summary
A19.8 Garfield County Employment Sectors in 1997
A19.9 Garfield County Emplyment Sector Growth
A19.10 Kane County Employment Sectors in 1997
A19.11 Kane County Employment Sector Growth
A19.12 Southwest Utah Employment Sector Growth
A19.13 Per Capita Income
A19.14 Average Annual Wages
A19.15 Unemployment Rates
A19.16 Net Migration
A19.17 Total Historic and Projected Population Growth

APPENDIX 19 - ECONOMIC CONDITIONS

TABLE A19.1
ECONOMIC, DEMOGRAPHIC AND FISCAL IMPACTS TO THE SOUTHWEST REGION

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Alternative A - No Action															
Visitor Days	217,190	227,462	238,219	249,486	261,285	273,642	286,584	300,138	314,332	329,198	344,768	361,073	378,150	396,034	414,764
Population	244	288	554	277	283	291	299	307	316	320	331	339	349	360	370
Employment	156	182	3[illegible]	168	172	175	180	184	189	193	197	202	208	214	219
Earnings ($)	4,700	5,511	10,86[illegible]	4,905	5,032	5,184	5,256	5,289	5,486	5,570	5,531	5,683	5,690	5,897	6,001
Revenue ($)	366	426	807	389	401	415	424	430	449	459	461	477	483	503	516
Expenditures ($)	200	237	455	225	232	238	247	256	269	274	283	291	300	309	317
Net Revenue ($)	166	189	351	164	170	178	178	174	180	185	178	186	183	194	199
Alternative B															
Visitor Days	218,134	229,443	241,338	253,850	267,011	280,854	295,414	310,730	326,839	343,784	361,607	380,355	400,074	420,816	442,633
Population	244	338	961	284	299	309	319	328	344	347	360	372	388	405	422
Employment	157	215	615	172	179	183	190	195	203	209	215	222	231	240	248
Earnings ($)	4,616	6,459	18,446	4,940	5,132	5,241	5,526	5,412	5,762	5,913	5,947	6,079	6,279	6,444	6,636
Revenue ($)	361	496	1,356	397	416	429	455	453	485	502	512	530	553	574	598
Expenditures ($)	201	278	791	232	244	253	262	274	295	299	310	320	334	349	362
Net Revenue ($)	160	218	565	165	172	176	193	179	189	203	202	210	219	225	236
Alternative C															
Visitor Days	215,080	223,064	231,345	239,933	248,839	258,077	267,657	277,593	287,897	298,584	309,668	321,164	333,086	345,450	358,274
Population	238	317	845	261	270	272	274	277	280	274	277	277	278	281	282
Employment	154	201	540	155	161	161	163	163	165	164	164	163	163	164	163

APPENDIX 19 - ECONOMIC CONDITIONS

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Earnings ($)	3,386	4,941	15,223	3,507	3,589	3,709	3,889	3,688	3,834	3,891	3,733	3,716	3,709	3,848	3,828
Revenue ($)	269	380	1,113	277	282	290	302	287	297	300	287	285	283	291	288
Expenditures ($)	196	261	695	213	220	222	226	231	242	238	240	240	242	246	245
Net Revenue ($)	73	119	418	64	62	68	76	56	54	61	47	45	40	45	43
Alternative D															
Visitor Days	209,873	212,394	214,945	217,526	220,139	222,783	225,459	228,167	230,907	233,680	236,487	239,327	242,202	245,111	248,055
Population	157	213	644	145	146	134	124	115	104	86	73	56	43	25	6
Employment	102	135	411	87	84	77	71	64	58	49	40	30	21	11	-1
Earnings ($)	3,269	4,392	12,921	3,066	3,031	2,937	3,033	2,626	2,642	2,553	2,269	2,034	1,819	1,771	1,480
Revenue ($)	254	327	927	216	205	189	186	147	138	120	88	59	30	13	-22
Expenditures ($)	130	175	530	117	118	110	102	97	94	80	70	54	44	30	13
Net Revenue ($)	125	152	397	100	87	80	84	50	43	40	18	5	-14	-17	-36
Alternative E															
Visitor Days	220,466	234,376	249,164	264,884	281,597	299,364	318,252	338,331	359,678	382,371	406,496	432,143	459,408	488,394	519,208
Population	246	309	671	304	317	332	348	368	390	408	429	454	482	513	544
Employment	159	197	427	183	192	200	210	222	234	246	259	273	289	307	324
Earnings ($)	4,691	5,821	12,994	5,127	5,386	5,616	5,762	5,887	6,302	6,640	6,581	6,942	7,237	7,732	7,963
Revenue ($)	369	457	977	425	453	480	501	523	566	604	616	659	698	753	792
Expenditures ($)	202	254	551	248	259	271	287	306	331	347	365	385	410	437	462
Net Revenue ($)	167	204	425	177	193	208	215	216	235	257	251	273	288	317	330

APPENDIX 19 - ECONOMIC CONDITIONS

TABLE A19.2
BUREAU OF THE CENSUS SUB-COUNTY POPULATION ESTIMATES, 1990-1996

	1990	1991	1992	1993	1994	1995	1996
GARFIELD COUNTY	3,980	3,992	4,063	3,998	3,974	4,033	4,076
Antimony	83	83	86	84	83	85	88
Boulder	126	125	127	125	128	131	135
Cannonville	131	133	136	133	134	138	141
Escalante	818	826	843	831	834	853	876
Hatch	103	102	104	100	101	101	101
Henrieville	163	163	164	161	159	162	161
Panguitch	1,444	1,440	1,464	1,440	1,414	1,420	1,408
Tropic	374	377	384	380	380	389	397
Balance of Garfield County	738	743	755	744	741	754	769
KANE COUNTY	5,169	5,111	5,196	5,678	5,679	5,858	5,751
Alton	93	93	96	107	107	109	106
Big Water	326	315	317	344	346	360	370
Glendale	282	284	292	324	328	339	333
Kanab	3,289	3,251	3,302	3,598	3,582	3,698	3,616
Orderville	422	408	410	442	440	443	430
Balance of Kane County	757	760	779	863	876	909	856

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APPENDIX 19 - ECONOMIC CONDITIONS

TABLE A19.3
PROJECTIONS OF POPULATION BY CITY IN GARFIELD AND KANE COUNTIES

	1996	1997	1998	1999	2000	2001	2002	2010	2020
Antimony	88	89	90	91	91	92	93	100	109
Boulder	135	138	142	145	149	152	155	181	217
Cannonville	141	144	147	149	151	154	157	177	202
Escalante	876	901	994	1,028	1,063	1,097	1,131	1,354	1,548
Hatch	101	102	103	105	107	108	109	121	138
Henrieville	161	163	165	167	169	171	173	193	220
Panguitch	1,408	1,421	1,534	1,582	1,631	1,679	1,727	2,013	2,319
Tropic	397	405	414	422	430	439	475	569	639
Balance of Garfield County	769	846	1,052	997	957	922	870	1,022	1,147
Garfield County	4,076	4,209	4,641	4,686	4,748	4,814	4,890	5,730	6,539
Alton	106	111	114	115	119	123	127	141	167
Big Water	370	400	420	432	450	478	503	662	845
Glendale	333	372	389	396	403	414	433	589	743
Kanab	3,616	4,096	4,339	4,414	4,514	4,652	4,806	6,369	8,450
Orderville	430	478	489	507	533	550	570	756	982
Balance of Kane County	896	1,084	1,354	1,416	1,465	1,479	1,489	1,793	2,008
Kane County	5,751	6,541	7,105	7,280	7,484	7,696	7,928	10,310	13,195

Notes:

(1) 1996 estimates are Census Bureau estimates.

(2) 1997 through 2020 subcounty numbers have been produced by Five County AOG analysts controlling to GOPB county totals. GOPB county totals include assumptions about federal employment related to the GSENM in Kane County.

Source: Governor's Office of Planning and Budget--Demographic and Economic Analysis Section

UPED Model System

1997 Baseline Projections(12/17/96)

The last year of historical data is 1995 for employment and 1996 for population.

APPENDIX 19 - ECONOMIC CONDITIONS

TABLE A19.4
ECONOMIC AND DEMOGRAPHIC PROJECTIONS SUMMARY

Year	Southwest Region				Garfield County				Kane County			
	Population		Employment		Population		Employment		Population		Employment	
	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change
1990	83,900	2.6%	36,364	2.6%	3,950	1.1%	1,474	1.3%	5,150	1.10%	1,572	1.7%
1991	87,553	4.4%	39,124	7.6%	4,097	3.7%	1,496	1.5%	5,248	1.9%	1,609	2.4%
1992	91,755	4.8%	41,883	7.1%	4,100	0.1%	1,527	2.1%	5,350	1.9%	1,709	6.2%
1993	97,152	5.9%	45,363	8.3%	4,200	2.4%	1,625	6.4%	5,450	1.9%	1,832	7.2%
1994	103,654	6.7%	50,657	11.7%	4,200	0.0%	1,768	8.8%	5,700	4.6%	2,048	11.8%
1995	110,955	7.0%	54,761	8.1%	4,300	2.4%	1,838	4.0%	5,900	3.5%	2,195	7.2%
1996	116,833	5.3%	59,181	8.1%	4,385	2.0%	1,952	6.2%	5,955	0.9%	2,372	8.1%
1997	122,851	5.2%	63,394	7.1%	4,209	0.0%	1,914	0.0%	6,492	9.0%	2,650	11.7%
1998	129,694	5.6%	67,950	7.2%	4,641	10.3%	2,151	12.4%	7,006	7.9%	2,916	10.0%
1999	134,752	3.9%	71,336	5.0%	4,686	1.0%	2,201	2.3%	7,178	2.5%	3,021	3.6%
2000	139,658	3.6%	74,457	4.4%	4,748	1.3%	2,252	2.3%	7,379	2.8%	3,131	3.6%
2001	144,258	3.3%	77,310	3.8%	4,814	1.4%	2,301	2.2%	7,590	2.9%	3,242	3.5%
2002	149,182	3.4%	80,190	3.7%	4,890	1.6%	2,350	2.1%	7,819	3.0%	3,355	3.5%
2003	154,370	3.5%	83,093	3.6%	4,970	1.6%	2,399	2.1%	8,065	3.1%	3,468	3.4%
2004	160,725	4.1%	86,705	4.3%	5,087	2.4%	2,467	2.8%	8,366	3.7%	3,613	4.2%
2005	167,079	4.0%	90,336	4.2%	5,200	2.2%	2,535	2.8%	8,665	3.6%	3,757	4.0%
2006	173,177	3.6%	93,847	3.9%	5,301	1.9%	2,597	2.4%	8,954	3.3%	3,897	3.7%
2007	179,402	3.6%	97,402	3.8%	5,404	1.9%	2,659	2.4%	9,248	3.3%	4,039	3.6%
2008	185,862	3.6%	101,047	3.7%	5,510	2.0%	2,722	2.4%	9,555	3.3%	4,184	3.6%
2009	192,618	3.6%	104,828	3.7%	5,622	2.0%	2,787	2.4%	9,874	3.3%	4,336	3.6%
2010	199,305	3.5%	108,628	3.6%	5,730	1.9%	2,852	2.3%	10,189	3.2%	4,487	3.5%
2011	205,915	3.3%	112,395	3.5%	5,832	1.8%	2,914	2.2%	10,500	3.1%	4,639	3.4%
2012	212,603	3.2%	116,129	3.3%	5,935	1.8%	2,973	2.0%	10,814	3.0%	4,789	3.2%
2013	219,234	3.1%	119,792	3.2%	6,032	1.6%	3,030	1.9%	11,126	2.9%	4,934	3.0%
2014	225,598	2.9%	123,313	2.9%	6,120	1.5%	3,082	1.7%	11,424	2.7%	5,075	2.9%
2015	231,764	2.7%	126,704	2.7%	6,201	1.3%	3,130	1.6%	11,714	2.5%	5,210	2.7%
2016	237,725	2.6%	129,963	2.6%	6,274	1.2%	3,173	1.4%	11,992	2.4%	5,341	2.5%
2017	243,515	2.4%	133,125	2.4%	6,342	1.1%	3,213	1.3%	12,262	2.3%	5,468	2.4%
2018	249,372	2.4%	136,263	2.4%	6,410	1.1%	3,251	1.2%	12,536	2.2%	5,593	2.3%
2019	255,113	2.3%	139,346	2.3%	6,473	1.0%	3,288	1.1%	12,801	2.1%	5,714	2.2%
2020	260,991	2.3%	142,447	2.2%	6,539	1.0%	3,324	1.1%	13,073	2.1%	5,837	2.2%

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APPENDIX 19 - ECONOMIC CONDITIONS

FIGURE A19.1
GARFIELD COUNTY EMPLOYMENT SECTORS IN 1997

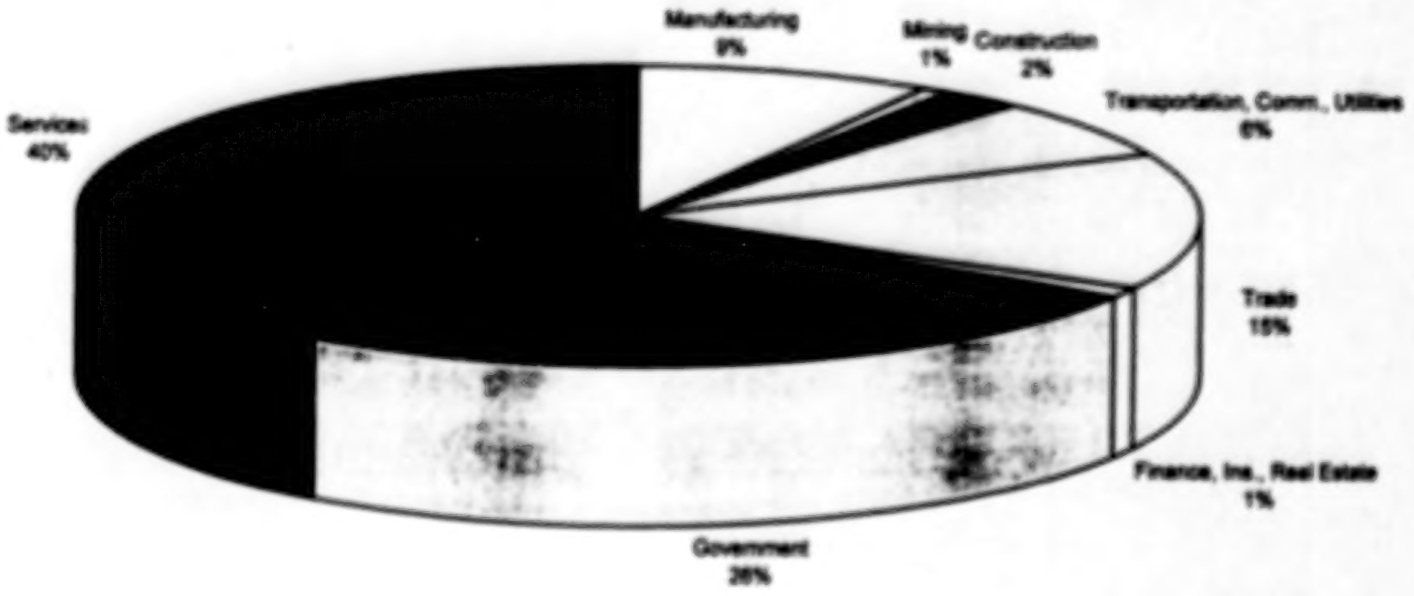

FIGURE A19.2
GARFIELD COUNTY EMPLOYMENT SECTOR GROWTH

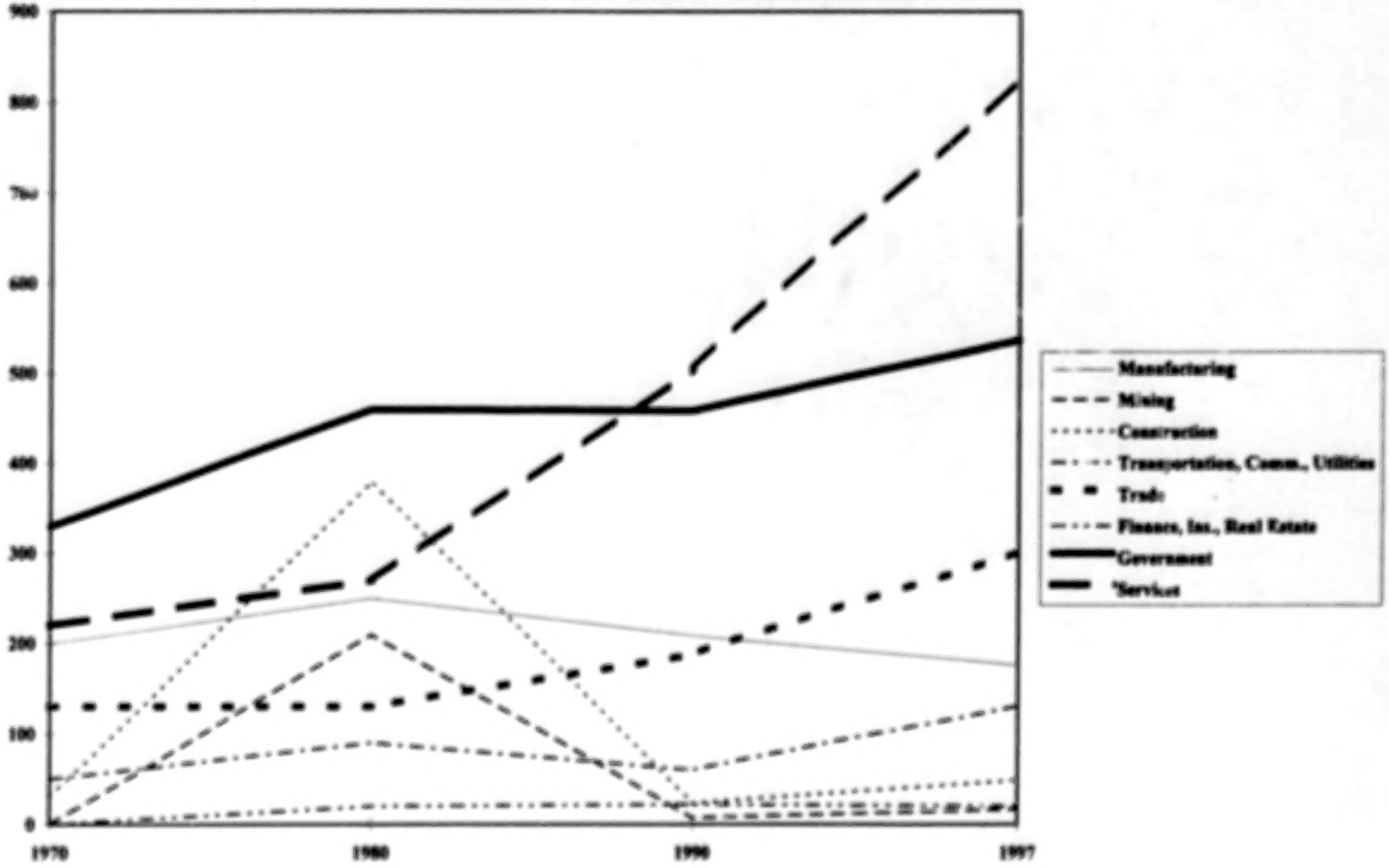

FIGURE A19.3
KANE COUNTY EMPLOYMENT SECTORS IN 1997

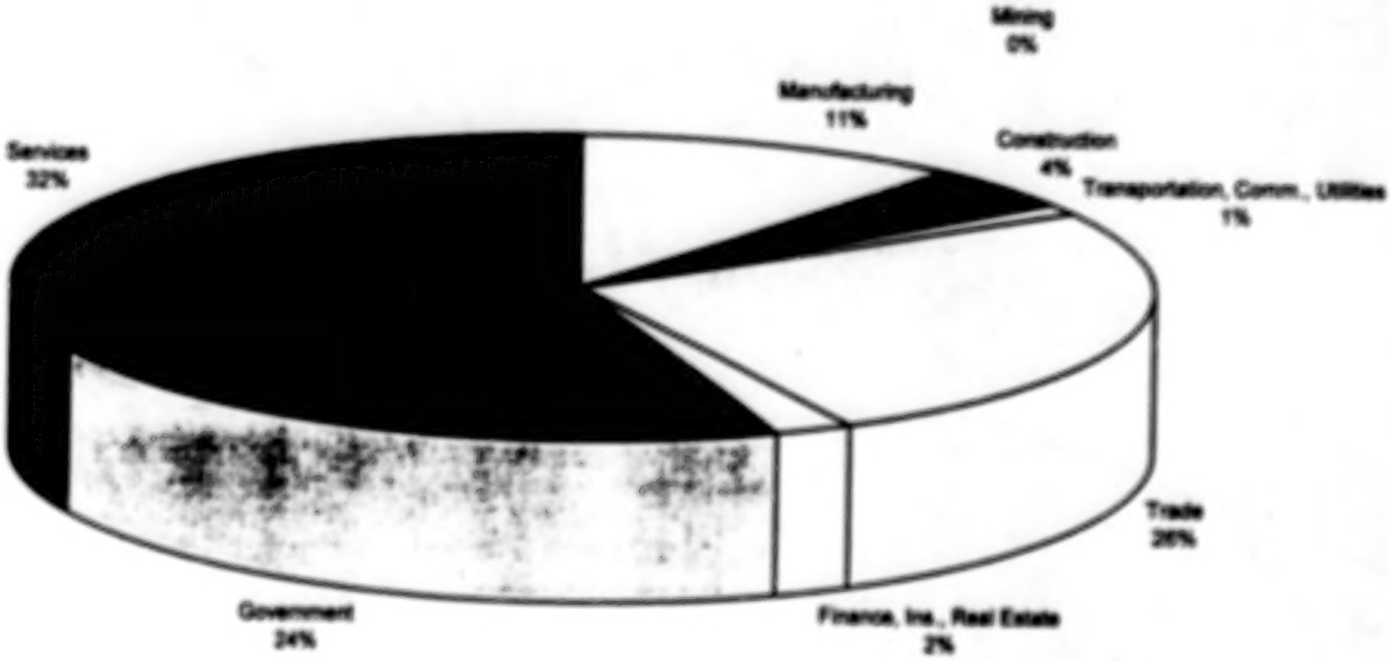

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FIGURE A19.4
KANE COUNTY EMPLOYMENT SECTOR GROWTH

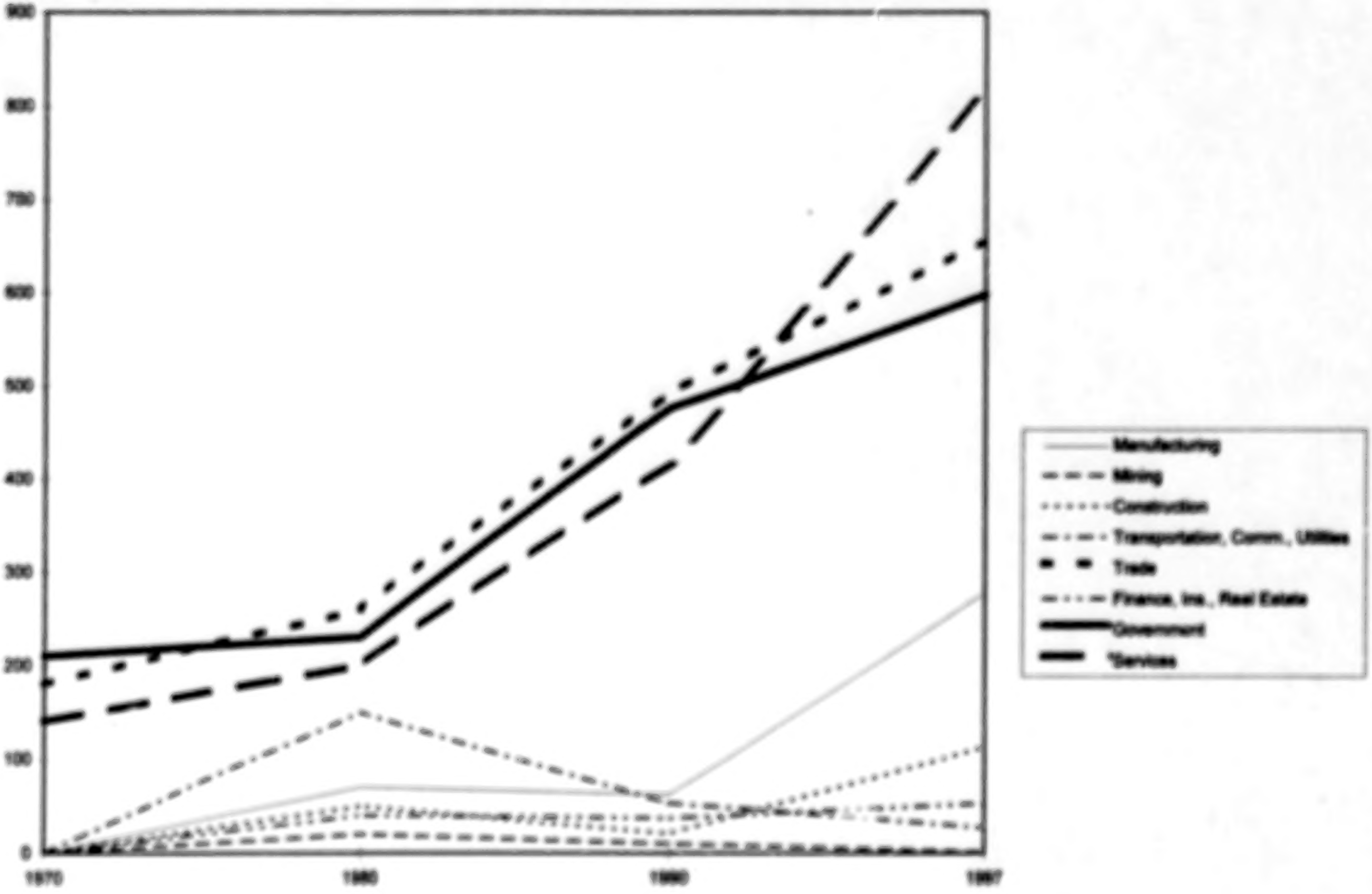

FIGURE A19.5
SOUTHWEST UTAH EMPLOYMENT SECTOR GROWTH

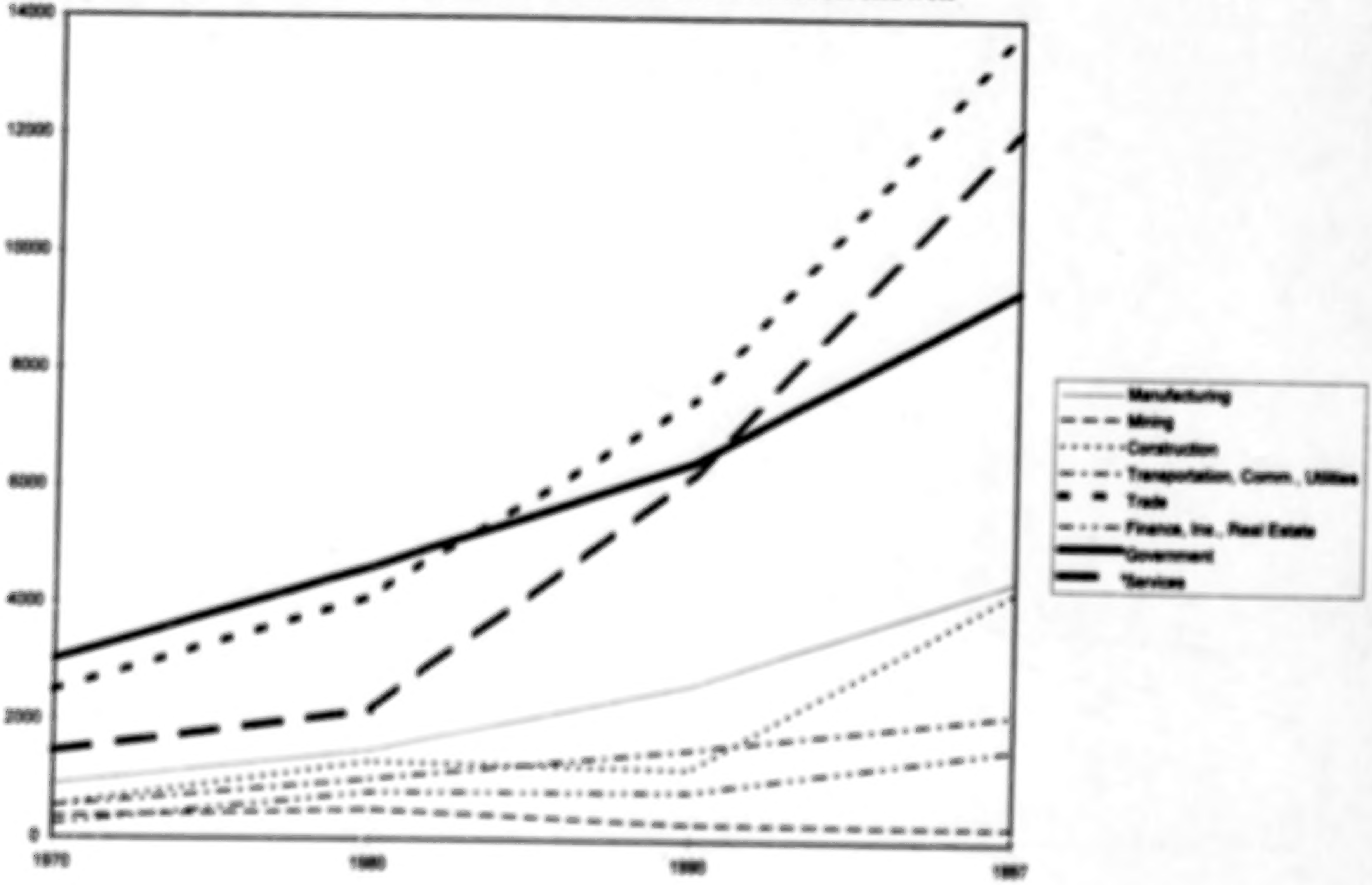

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FIGURE A19.6
PER CAPITA INCOME

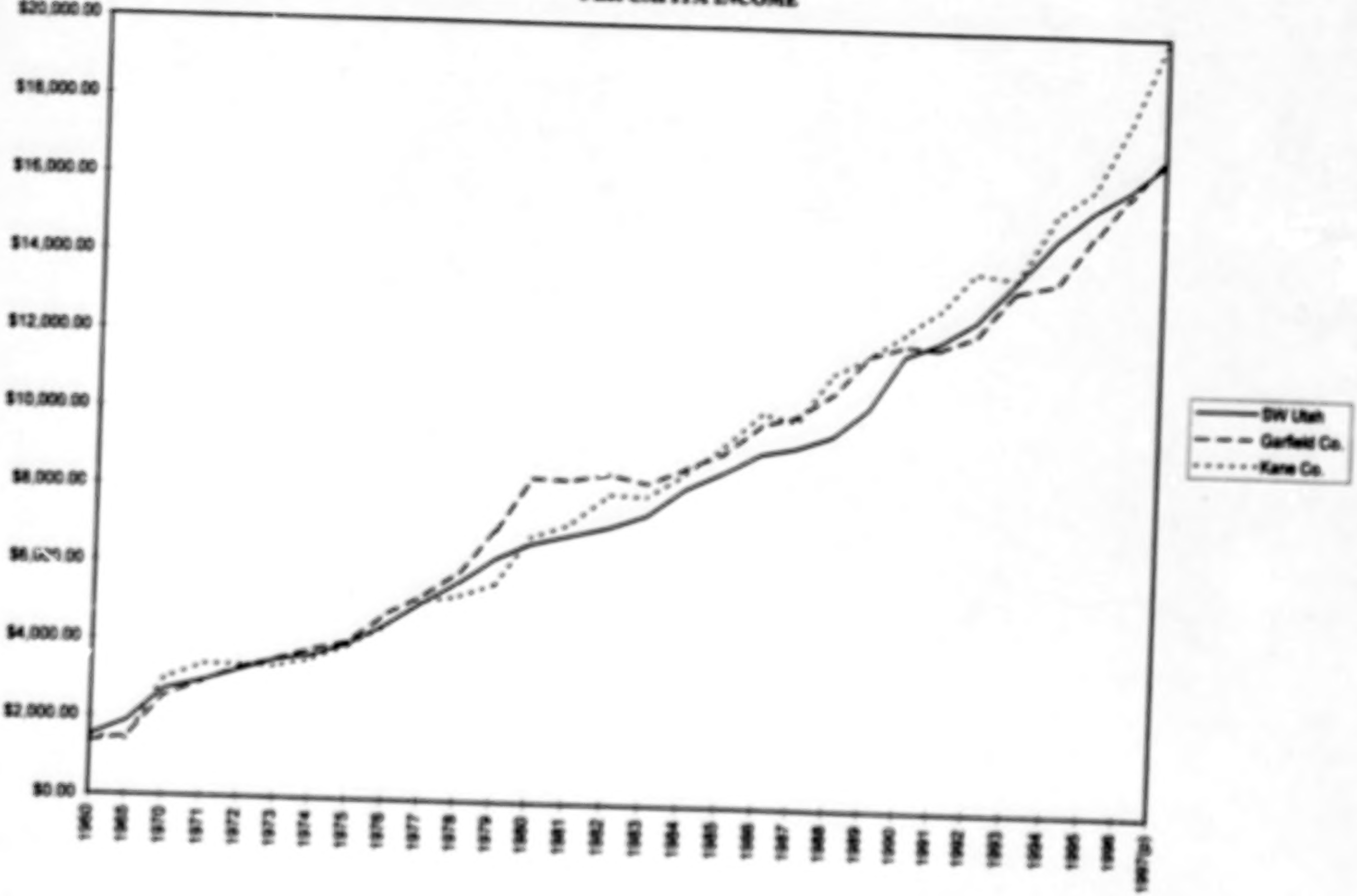


FIGURE A19.7
AVERAGE ANNUAL WAGES

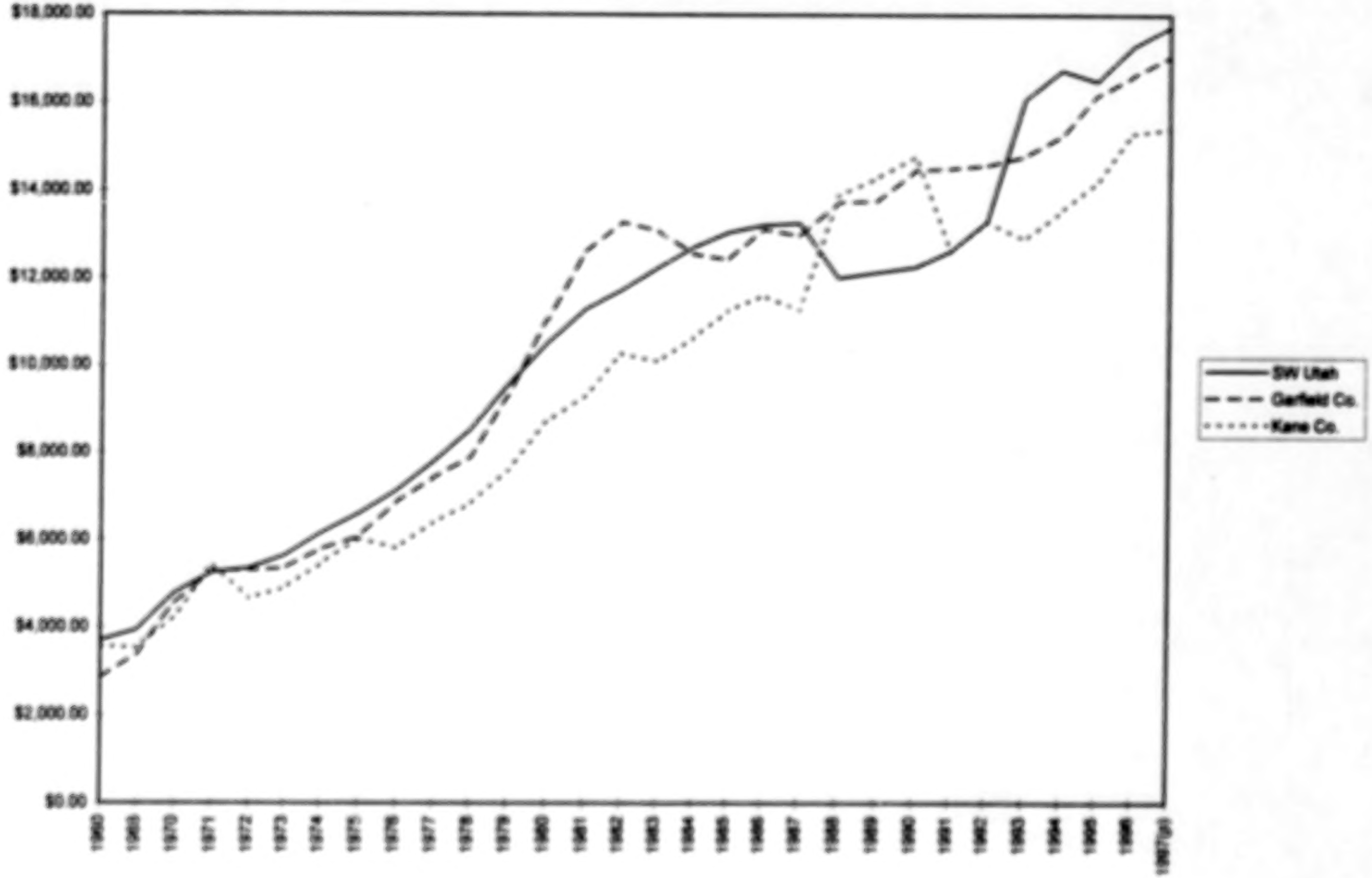


FIGURE A19.8
UNEMPLOYMENT RATES

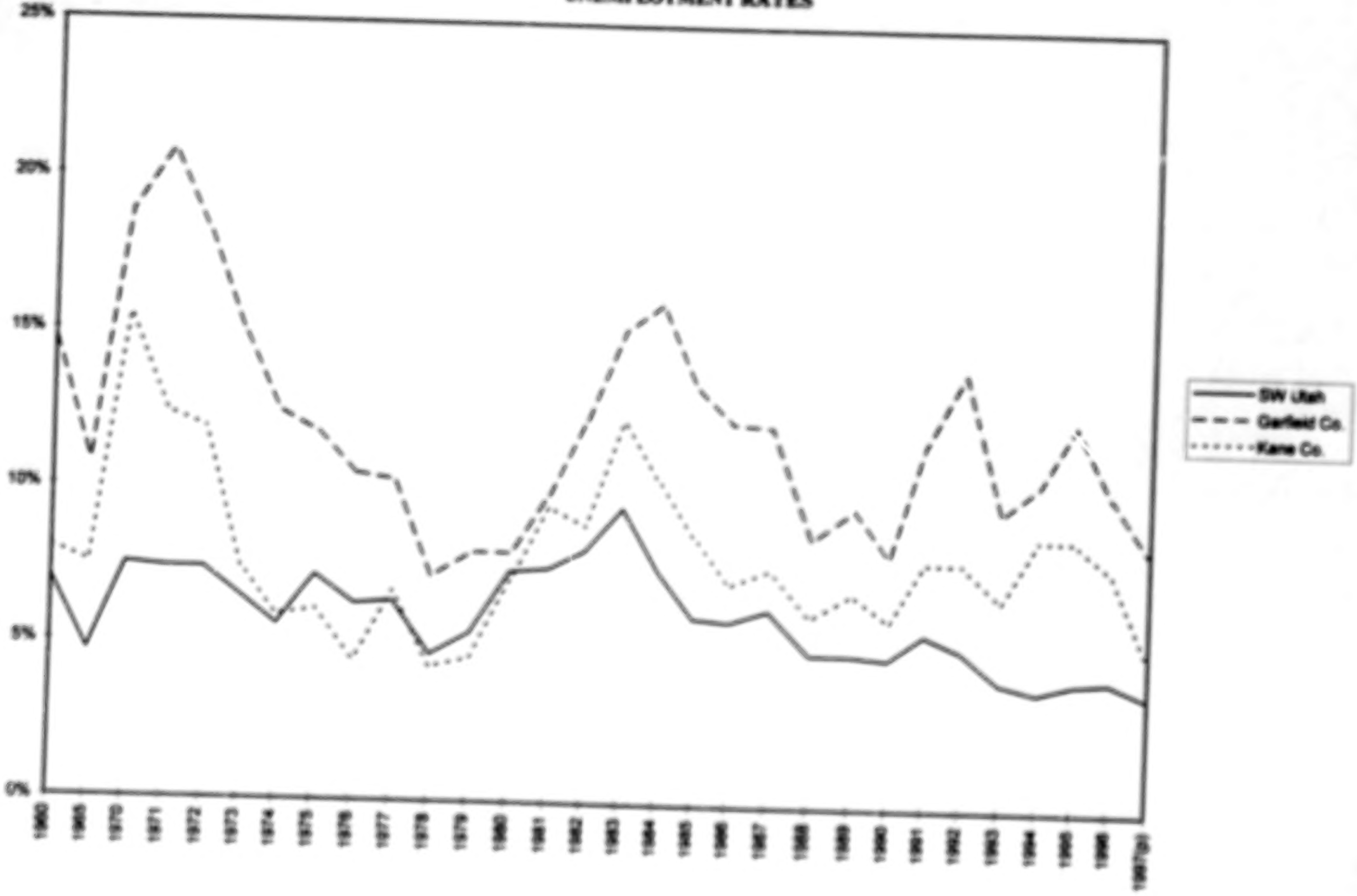


FIGURE A19.9
NET MIGRATION

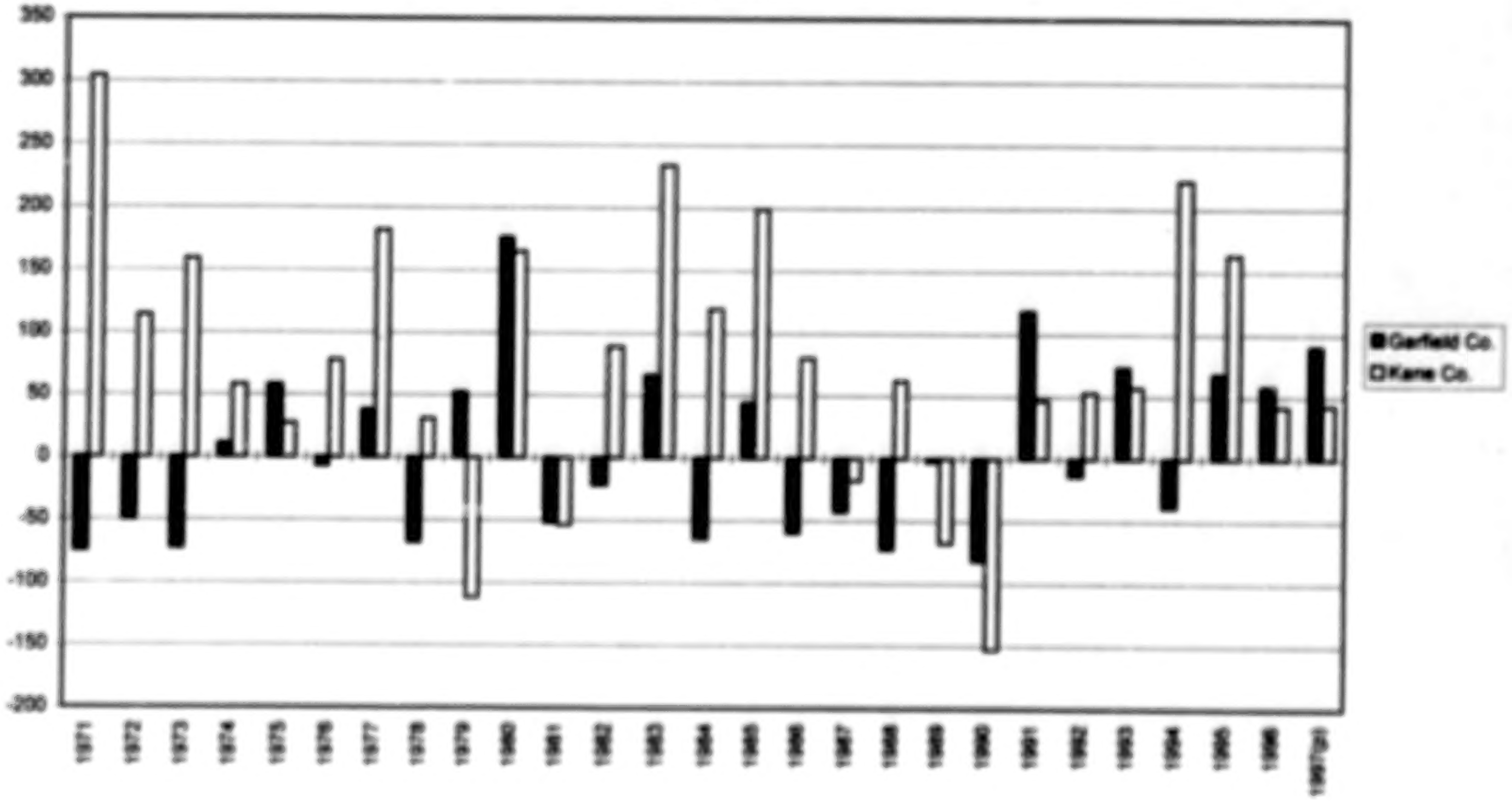
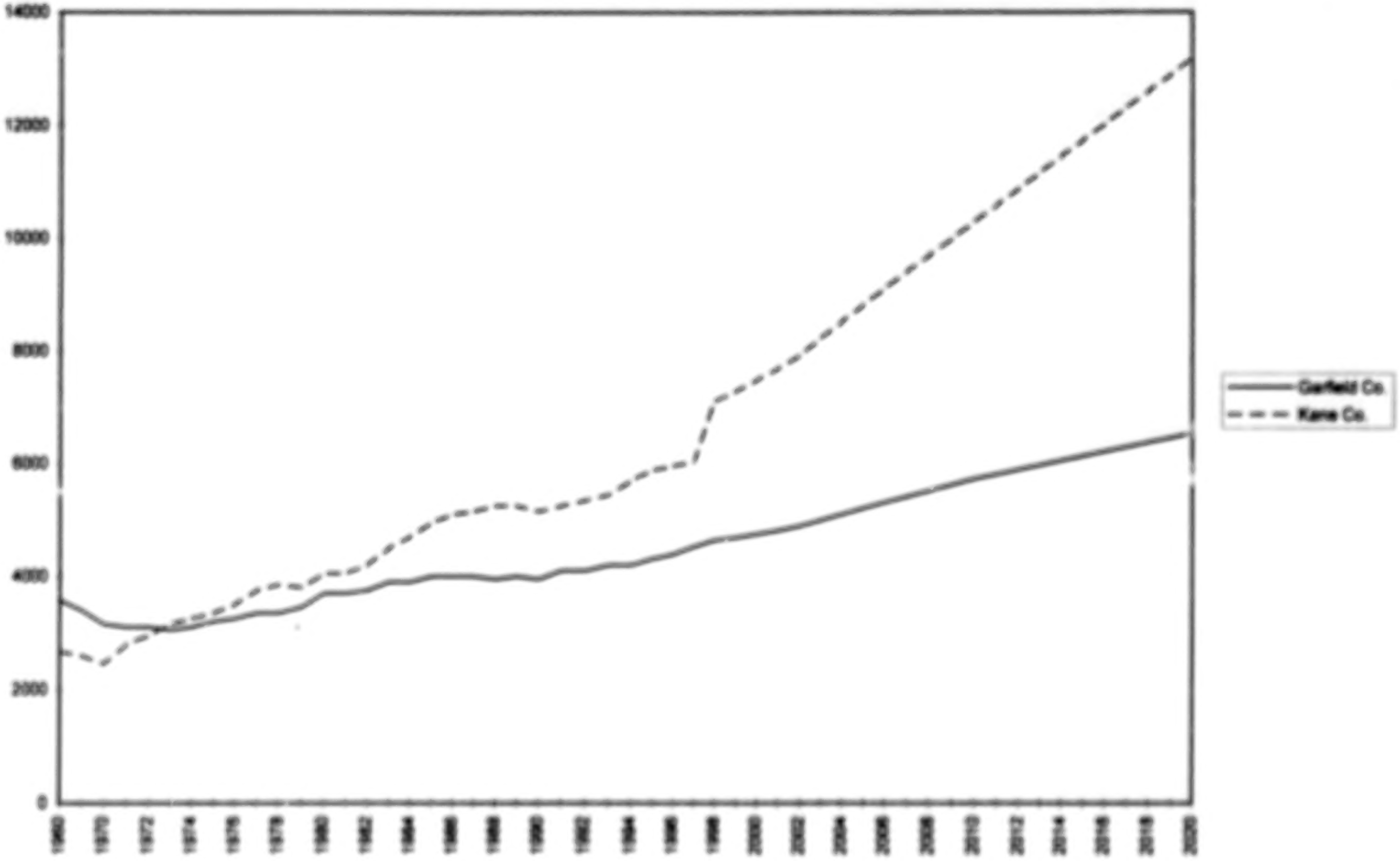


FIGURE A19.10
TOTAL HISTORIC AND PROJECTED POPULATION GROWTH



Appendix 20

Recreation Opportunity Spectrum

APPENDIX 20 - RECREATION OPPORTUNITY SPECTRUM (ROS) SETTING DESCRIPTION

TABLE A20.1
RECREATION OPPORTUNITY SPECTRUM

ROS CLASSES	PHYSICAL SETTING	SOCIAL SETTING	MANAGERIAL SETTING
Primitive	Area is characterized by essentially unmodified natural environment of fairly large size.	Concentration of users is very low and evidence of other users is minimal.	Only facilities essential for resource protection are used. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts between groups. Motorized use within the area is not permitted.
Semi-Primitive Non-Motorized	Area is characterized by a predominantly unmodified natural environment of moderate to large size.	Concentration of users is low, but often other area users are evident.	Facilities are provided for the protection of resource values and the safety of users. On-site controls and restrictions may be present but are subtle Spacing of groups may be formalized to disperse use and limit contacts between groups. Motorized use is not generally permitted.
Semi-Primitive Motorized	Same as Semi-Primitive Non-Motorized	Same as Semi-Primitive Non-Motorized.	Same as Semi-Primitive Non-Motorized; except that motorized use is permitted.
Roaded Natural	Area is generally characterized by a generally natural environment. Resource modification and utilization practices are evident, but harmonize with the natural environment.	Concentration of users is low to moderate. Moderate evidence of the sights and sounds of humans.	On-site controls and restrictions offer a sense of security. Rustic facilities are provided for user convenience as well as for safety and resource protection. Facilities are sometimes provided for group activity. Conventional motorized use is provided for in construction standards and design of facilities.
Rural	Area is characterized by a substantially modified natural environment. Resource modification and utilization practices are evident.	Concentration of users is often moderate to high. The sights and sound of humans are readily evident.	A considerable number of facilities are designed for use by large numbers of people. Facilities are often provided for specific activities. Developed sites, roads, and trails, are designed for moderate to high use. Moderate densities are provided far away from developed sites. Facilities for intensive motorized use are available.

Appendix 21

Visitor Facilities

APPENDIX 21 - VISITOR FACILITIES

TABLE A21.1
VISITOR FACILITIES

SITE	FACILITIES
Escalante Interagency Center	visitor contact center, interpretive displays, interpretive association sales
Kanab Field Office	visitor contact center, interpretive displays, interpretive association sales
Anasazi State Park	visitor contact center, interpretive displays
Paria Contact Station	visitor contact center, interpretive association sales
Calf Creek Campground	13 individual sites, 5 picnic sites, 1 group area, flush toilets and vault toilet, drinking water
Deer Creek Campground	7 individual sites, 1 vault toilet
Highway 12 Scenic Byway	interagency interpretive plan, interpretive pullouts and signs, route guide, video
White House Campground/Trailhead	5 individual sites, 2 vault toilets
Devils Garden Picnic Site	4 picnic sites, 1 vault toilet
Grosvenor Arch	picnic site, toilet
Paria Movie Set	3 picnic sites, toilet
Wolverine Petrified Wood Area	interpretive sign
Old Pareah Townsite and Cemetery	interpretive sign
Dance Hall Rock	interpretive sign
Lower Calf Creek Falls Trail	2¼ miles of developed interpretive trail with brochure
Kodachrome State Park	kiosk panel, interpretive
13 Trailheads BLM Developed	register boxes
6 Trailheads BLM Undeveloped	secondary trailheads, no facilities
6 Trailheads NPS Administered on BLM	register boxes
4 Hiking Trail Easements	maintained trails

Appendix 22

Grazing Allotments

APPENDIX 22 - GRAZING ALLOTMENTS

TABLE A22.1
GRAZING ALLOTMENTS

ALLOTMENT	ALLOTMENT MANAGEMENT PLAN (AMP)	GRAZING PERIOD[1]	ACTIVE PREFERENCE (Number of animal unit months)	ALLOTMENT CATEGORY[2]
Alvey Wash	1990	05/15 through 09/23	1,276	I
Big Bowns Bench	1984	10/16 through 04/15	1,275	M
Big Horn	1983	11/10 through 06/15	4,392	I
Blackridge	No AMP	10/15 through 04/15	848	I
Black Rock	No AMP	Year-long	408	I
Boot	No AMP	08/01 through 10/31	45	C
Boulder Creek	No AMP	10/16 through 11/29	80	C
Bunting Well	1981	Year-long	3,307	M
Calf Pasture	1991	08/10 - 10/15 odd years	176	M
	1991	06/10 - 08/15 even years		
Cedar Wash	1984	06/15 through 10/31	898	M
Circle Cliffs	1996	11/01 through 03/31	1,050	I
Clark Bench	1982	08/01 through 04/30	1,296	I
Cockscomb	No AMP	03/01 through 05/31	36	C
Collet	No AMP	09/15 through 10/15	92	C
Cottonwood	1981	11/10 through 05/31	2,233	I
Coyote	1978	11/01 through 05/31	2,044	M
Death Hollow	No AMP	11/01 through 05/15	1,082	C
Deer Creek	No AMP	11/01 through 04/30	587	M
Deer Range	No AMP	08/01 through 10/15	213	M
Deer Spring Point	1988	06/10 through 10/07	503	I
Dry Valley	No AMP	07/01 through 10/31	531	M
First Point	1979	Summer Use	396	M
Five Mile Canyon	No AMP	11/01 through 04/30	385	C
Flood Canyon	1989	07/01 through 10/31	148	I
Fordwell	No AMP	06 10 through 10/09	291	C
Fortymile Ridge	1987	11/01through 06/15	4,155	I
Granary Ranch	No AMP	07/01 through 11/30	70	C
Haymaker Bench	No AMP	11/10 through 12/31	100	C

APPENDIX 22 - GRAZING ALLOTMENTS

ALLOTMENT	ALLOTMENT MANAGEMENT PLAN (AMP)	GRAZING PERIOD,	ACTIVE PREFERENCE (Number of animal unit months)	ALLOTMENT CATEGORY,
Headwaters	1982	11/01 through 03/15	3,607	M
Hells Bellows	No AMP	05/01 through 10/15	44	C
Johnson Canyon	No AMP	06/10 through 11/15	176	C
Johnson Lakes	1986	06/01 through 11/30	319	I
Johnson Point	No AMP	11/01 through 03/31	135	C
King Bench	1983	11/01 through 03/31	2,414	I
Lake	1989	09/01 through 05/01	1,308	I
Last Chance	1982	Year-long	3,708	I
Little Bowns Bench	No AMP	11/01 through 02/28	130	M
Little Desert	No AMP	09/24 through 10/08	107	C
Locke Ridge	1986	12/01 through 04/30	145	I
Lower Cattle	1967	10/01 through 04/15	6,875	I
Lower Hackberry	1981	11/01 through 03/31	435	I
McGath Point	No AMP	10/01 through 02/28	60	M
Meadow Canyon	1986	09/01 through 11/30	144	I
Mill Creek	No AMP	06/01 through 09/30	300	C
Mollie's Nipple	1976	Year-long	3,436	M
Moody	No AMP	11/01 through 03/31	1,600	C
Mudsprings	No AMP	07/15 through 10/15	195	M
Neaf	No AMP	03/01 through 11/30	9	C
Nipple Bench	1981	12/01 through 04/30	885	I
Phipps	No AMP	09/01 through 03/31	280	M
Pine Point	1988	06/16 through 10/15	365	I
Rock Creek-Mudholes	1982	Year-long	2,100	M
Round Valley	1983	11/01 through 03/31	495	I
Roy Willis	No AMP	11/01 through 04/30	10	C
Rush Beds	1982	11/01 through 05/31	247	M
Salt Water Creek	No AMP	10/16 through 03/15	130	C
School Section	No AMP	06/01 through 07/31	2	C
Second Point	No AMP	07/01 through 03/31	21	C
Sink Holes	1982	10/15 through 03/31	154	I

APPENDIX 22 - GRAZING ALLOTMENTS

ALLOTMENT	ALLOTMENT MANAGEMENT PLAN (AMP)	GRAZING PERIOD[1]	ACTIVE PREFERENCE (Number of animal unit months)	ALLOTMENT CATEGORY[2]
Soda	No AMP	10/01 through 06/01	2,755	I
Steep Creek	1969	05/15-06/16, 11/10-03/31	318	C
Swallow Park	1992	05/10 through 11/10	734	I
Timber Mountain	No AMP	06/15 through 10/15	373	M
Upper Cattle	1984	11/01 through 06/15	6,297	I
Upper Hackberry	1981	11/01 through 06/15	605	I
Upper Paria	1976	05/01 through 09/30	2,525	M
Upper Warm Creek	1981	11/01 through 05/31	1,677	I
Vermillion	1974	Year-long	2,556	M
Wagon Box Mesa	No AMP	11/01 through 03/31	633	C
Wahweap	No AMP	12/01 through 04/30	400	M
White Rocks	1981	12/01 through 01/31	60	C
White Sage	No AMP	05/06 through 06/05	73	C
Willow Gulch	1983	11/01 through 03/31	404	M

[1] Grazing season-of-use schedules may vary slightly due to yearly climatic conditions, vegetative growth, and availability of livestock water.

[2] There are three categories in which allotments are placed. These categories assist in prioritizing the levels and type of resource management applied on each allotment. The "I" (Intensive) category receives the highest management priority due to identified resource conflicts or multiple resource issues. The "M" (Maintain) category describes allotments in which the current level of management is satisfactory in order to maintain resource conditions. The "C" (Custodial) allotments are usually small parcels of public land within larger blocks of private land. The level of management needed is low, provided that resources are not being negatively impacted.

Livestock grazing allotments that are totally or partially within the Monument, and administered by Monument personnel, were placed in an M, I, or C category by analyzing each allotment using the following categories: range condition, resource potential, present productivity, resource use conflicts, controversy, and present management situation. A number of criteria were used to further define both resource conflicts and level of controversy. These include: recreation concerns, deer herd management, multiple wildlife species concerns, watershed values, riparian resources, multiple resource concerns within the allotment, adjacent federal management within the allotment (Glen Canyon National Recreation Area, Capitol Reef National Park, and Dixie National Forest), vegetation, and archeological resources. An interdisciplinary team approach was used to categorize each allotment.

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Appendix 23

Allotment Trend

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APPENDIX 23 - ALLOTMENT TREND

The following table summarizes the vegetative trend data on the Monument. Trend describes the direction of change over time of a rangeland area (BLM Manual Handbook 4400-1, Rangeland Monitoring and Evaluation). Vegetation data are collected at different times on the same site and the results are then compared to detect a change. In this table, trend is described as upward, static, or downward. These categories indicate whether rangeland conditions are moving toward or away from management objectives. Trend data are also used to determine if changes in management are needed in order to improve resource conditions. The trend of a rangeland area is judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. The table lists allotments where trend data sites are located. A number of these allotments have several sites located in various grazing pastures.

TABLE A23.1
ALLOTMENT TREND

ALLOTMENT	PASTURE	TREND	DATE ESTABLISHED	DATE LAST READ
Alvey Wash	Camp Flat	upward	8/26/69	9/1/95
	Little Valley	static	8/26/69	8/8/89
Big Bowns	Horse	static	1966	1997
	Middle	static	1968	1997
	Seep	upward	1968	1997
Big Horn	10-Mile	downward, static	7/25/67, 7/26/67	9/3/97, 9/3/97
	Big Flat	static, downward, downward	9/8/67, 7/26/67, 7/26/67	7/10/97, 7/10/97, 7/25/97
	Spencer Flat	static	7/28/67	8/1/97
Blackrock	Blackrock	upward	1987	1992
	Chalk Ridge	upward, upward	1981, 1987	1992, 1992
	East Pine	upward, no data	1981, 1970	1992, 1980
	West Pine		1992	
Blackridge	Blackridge	downward, downward	8/25/67, 8/30/67	8/24/95, 8/24/95
Boulder Cr.	Boulder Cr.	no data	1988	1988
Bunting Well	Bunting Well	static, static	6/20/67, 7/25/68	6/19/97, 6/19/97
	Cedar Mountain	static, static, static	9/15/82, 9/15/82, 9/15/82	6/19/97, 6/19/97, 6/19/97
	East Clark Bench	static, static, static, static, static, static, static, static, static, static	7/6/67, 7/18/68, 6/16/67, 7/25/68, 6/15/67, 7/25/68, 6/16/67, 7/25/68, 6/16/67, 7/24/68	6/12/97, 6/12/97, 6/12/97, 6/12/97, 6/19/97, 6/19/97, 6/19/97, 6/19/97, 6/19/97, 6/19/97
	Flat Top	static, static, static	9/20/82, 9/29/82, 9/29/82	6/19/97, 6/19/97, 6/19/97
	Judd Hollow	static, static, static, static, downward, downward	7/12/67, 7/18/68, 7/12/67, 7/18/68, 7/13/67, no date	6/18/97, 6/18/97, 6/18/97, 6/18/97, 9/28/93, 9/28/93
Calf Pasture	Calf Pasture		1991	

APPENDIX 23 - ALLOTMENT TREND

ALLOTMENT	PASTURE	TREND	DATE ESTABLISHED	DATE LAST READ
Cedar Wash	East	static, static	9/1/67, 10/2/68	8/25/92, 9/11/91
	West	upward, upward	9/16/81, 9/16/81	7/17/95, 7/17/95
Circle Cliffs	Lampstand	downward, downward	9/5/85, 9/6/85	7/24/95, 7/24/95
	Onion Beds	static, static	8/8/69, 9/5/85	7/25/95, 7/25/95
	Prospect	upward, upward	9/3/86, 9/3/86	9/20/96, 9/20/96
	White Flats	upward, static	9/9/87, 9/9/87	7/24/95, 7/24/95
Clark Bench	Bull Pasture	static, static	6/29/67, 7/25/68	6/14/96, 6/14/96
	Calf Spring Pasture	static, static	7/5/67, 7/26/68	6/14/96, 6/14/96
	West Clark Bench Pasture	static, static, static, static	6/29/67, 7/26/68, 7/5/67, 7/26/68	6/14/96, 6/14/96, 6/14/96, 6/14/96
Cottonwood	Brigham Plains	static, static, static, static, static, static	6/21/67, 7/24/68, 7/24/68, 7/24/68, 6/22/67, 7/24/68	8/15/96, 8/15/96, 8/15/96, 8/15/96, 8/15/96, 8/15/96
	Butler Valley	downward, static, upward, static, static, upward, static, static	8/3/70, 8/3/70, 8/30/70, 8/30/70, 7/31/70, 7/31/70, 8/3/70, 8/3/70	6/27/96, 6/27/96, 6/27/96, 6/27/96, 9/8/87, 6/27/96, 6/27/96, 6/27/96
	Gravelly Hills	static, downward, static, static	7/24/70, 7/24/70, 7/24/70, 7/24/70	6/27/96, 6/27/96, 7/17/96, 7/17/96
	North Coyote	downward, static	6/20/67, 7/10/68	7/17/96, 7/17/96
	Wiggle Rim	static, static, static, static	10/6/66, 7/2/67, 6/21/67, 7/10/68	6/14/96, 6/14/96, 6/14/96, 6/14/96
Coyote	Fivemile	downward, downward, downward, upward	6/28/67, 7/22/68, 6/27/67, 7/22/68	7/9/96, 7/9/96, 7/9/96, 7/9/96
	Sand Gulch	downward, downward, downward, downward, downward, downward	6/26/67, 7/22/68, 6/26/67, 7/22/68, 6/27/67, 7/22/68	7/9/96, 7/9/96, 7/9/96, 7/9/96, 7/9/96, 7/9/96
	South Coyote	static, static, static, staric, upward, no data, no data, static	8/18/93, 7/2/68, 6/13/67, 7/17/68, 6/15/67, no date, 8/16/93, 7/17/68	8/5/96, 8/5/96, 8/5/96, 8/5/96, 8/14/96, 8/14/96, 8/5/96, 8/5/96
	White Sands	upward, upward, upward, upward, static, static	6/15/67, 7/17/68, 6/13/67, 6/13/67, 6/23/67, 7/11/68	8/15/96, 8/15/96, 8/15/96, 8/15/96, 8/14/96, 8/14/96
Death Hollow	Death Hollow	upward, downward	9/9/82, 9/9/82	9/14/88, 9/14/88
Deer Creek	Brigham Tea	unknown	6/24/83	6/24/83
	Cottonwood	unknown	4/8/83	4/8/83
	Wolverine	unknown	4/5/83	4/5/83
Deer Range	Deer Range	static	8/21/89	6/30/93
Deer Spring Point	Crawford Bench	static	1981	1997
	Deer Spring Point	static	1959	1997
	Deer Spring Point Seeding	static	1968	1997
Dry Valley	Dry Valley	static, static, static	9/8/83, 9/8/83, 9/8/83	6/6/96, 6/6/96, 6/6/96

APPENDIX 23 - ALLOTMENT TREND

ALLOTMENT	PASTURE	TREND	DATE ESTABLISHED	DATE LAST READ
First Point	Middle	downward	1967	1992
	North	downward	1967	1992
	South	downward	1967	1992
Ford Well	Ford Well	static, no data	1982, 1959	1989, 1982
Fortymile Ridge	West	static, downward, upward	8/26/68, 8/23/68, 8/3/81	8/11/97, 8/11/97, 8/21/97
	East	downward, downward	8/29/88, 7/31/81	8/19/97, 8/19/97
	Middle	static, static	8/23/68, 9/81	8/11/97, 8/11/97
	Big Hollow	downward, downward	8/28/67, 8/30/97	8/6/97, 8/6/97
	Red Well	static, downward	8/31/67, 8/2/67	8/19/97, 8/6/97
Haymaker	Haymaker	no data		
Headwaters	Headquarters	static, static, upward, static, static	10/13/83, 10/13/83, 10/13/83, 8/24/60, 8/24/60	8/27/96, 8/27/96, 8/27/96, 8/29/96, 8/27/96
	Fourmile	static	8/24/60	8/29/96
King Bench	Bench	downward, downward	1970, 1970	1996, 1996
	Horse	upward, static	1970, 1970	1995, 1995
Lake	Lake	static	1967	1993
	Navajo	static	1967	1995
	Spencer	static	1968	1993
	Steer	static	1968	1994
Last Chance	Summer	static, upward, upward, static	9/9/69, 9/9/69, 9/9/69, 9/9/69	9/21/93, 9/20/95, 8/29/95, 9/21/93
	Winter	static, downward, downward	9/22/83, 8/29/86, 9/22/83	9/19/95, 9/19/95, 10/2/90
Little Bowns	Little Bowns	static	1970	1997
Lower Cattle	Lower Cattle	static, static, downward, static	8/1/87, 8/2/67, 9/1/67, 8/2/67	7/9/97, 8/9/88, 7/9/97, 8/9/88
	Sunset Flat Exclosure	no data	6/01/77	2/27/78
Lower Hackberry	Lower Hackberry	upward, static, upward, no data, no data	7/13/82, 7/13/82, 7/13/82, 6/16/97, 6/16/97, 6/16/97	9/16/96, 9/16/96, 9/16/96, 6/16/97, 6/16/97, 6/16/97
McGath Point	McGath Point	unknown	9/23/88	9/23/88
Mill Creek	Mill Creek	static	1959	1989
Moody	Moody	unknown, static	9/8/82, 9/8/82	9/8/82, 9/19/88
Mud Springs	Mud Springs	no data	1981, 1981	1995, 1995
Nipple Bench	Tibbet	static, static, static	9/18/69, 9/18/69, 9/24/82	7/26/96, 7/246/96, 7/26/96
	Nipple	upward, upward, static, static, static, upward, downward, static	9/18/69, 9/18/69, 9/23/82, 9/19/69, 9/19/69, 9/23/82, 9/19/69, 9/19/69	7/26/96, 7/26/96, 7/26/96, 7/26/96, 7/26/96, 7/26/96, 7/26/96, 7/26/96

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APPENDIX 23 - ALLOTMENT TREND

ALLOTMENT	PASTURE	TREND	DATE ESTABLISHED	DATE LAST READ
Phipps	Lower River	unknown	1/13/84	1/13/84
	Phipps	static	9/8/83	9/7/93
Pine Point	Cutler Point	upward, no data, no data	1981, 1969, 1968	1991, 1980, 1980
	Pine Point	static,no data, no data	1988, 1968, 1968	1991, 1969, 1980
Round Valley	Round Valley	upward, static, upward	9/8/83, 9/8/83, 9/8/83	7/12/95, 7/12/95, 7/12/95
Salt Water Creek	Salt Water Creek	unknown	9/23/88	9/23/88
Second Point	Canyon	static	1971	1989
	Top	static	1969	1989
Soda	Bench	static	1987	1994
	Carcass	downward, downwar d, downward	1967, 1967, 1982	1995, 1995, 1995
	Hole-in-the-Rock	static	1971	1992
	Soda	downward, downward	1971, 1971	1996, 1996
Steep Creek	Steep Creek	no data		
Swallow Park	Bulrush Hollow	downward	1968	1995
	Dry Valley	no data		
	Dunham Flat	downward	1969	1995
	Mud Point	downward	1968	1995
	Park Wash	no data		
	Podunk	downward	1982	1995
Timber Mountain	Timber Mountain	upward, upward	1982, 1959	no date, 1982
Upper Cattle	Seep Flat	static, static, static	8/1/68, 8/1/68, 7/27/67	9/12/90, 9/12/90, 9/12/90
	Allen Dump	downward, upward, static, upward	9/3/68, 7/31/67, 8/29/67, 9/5/67	8/23/95, 8/23/95, 8/23/95, 9/23/95
Upper Hackberry	North Jodi Point	upward, upward, upward	9/17/69, 9/17/69, 9/17/69	8/13/96, 8/13/96, 8/13/96
	Middle Jodi Point	upward, upward, static	9/17/69, 7/13/82, 7/13/82	8/13/96, 9/16/96, 9/16/96
	Johnson Hole	static	7/13/82	9/16/96
Upper Paria	Between the Creeks	downward, downward	8/4/70, 8/4/70	7/25/89, 7/25/89
	Building	static, static	8/13/70, 8/13/70	9/17/87, 9/17/87
	Indian Hollow	downward, static	7/31/68, 8/7/68	9/14/88, 9/14/87
	Jim Hollow	downward	8/8/68	9/14/87
	Lower Coal Bench	upward	9/4/69	9/10/87
	Lower Jim Hollow	downward	8/8/68	9/14/87
	Sheep Creek	static, static, static	9/1/72, 8/7/68, 8/7/68	9/17/87, 9/15/87, 9/15/87

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APPENDIX 23 - ALLOTMENT TREND

ALLOTMENT	PASTURE	TREND	DATE ESTABLISHED	DATE LAST READ
Upper Paria	Upper Coal Bench	static	7/30/68	9/10/87
	Willis Creek	static, static, downward, static	8/5/70, 8/5/70, 8/5/70, 8/5/70	8/29/88, 7/27/89, 7/27/89, 7/27/89
Upper Wahweap Creek	Ahlstrom Point	static, static, static, static, static, upward, no data, static, upward, upward, static, static, static, upward, upward	7/20/67, 7/20/67, 7/18/67, 7/18/67, 7/20/67, 7/16/68, 10/18/83, 8/6/70, 8/6/70, 9/21/81, 7/20/67, 7/17/68, 7/18/67, 7/15/68, 9/21/81	9/9/96, 9/9/96, 9/9/96, 9/9/96, 10/18/83, 10/18/83, 10/18/83, 7/9/96, 7/9/96, 7/9/96, 7/24/80, 7/24/80, 9/25/93, 9/25/93, 7/25/93,
	Heads of Creek	upward, upward, upward, upward, upward, static, static, static, upward, upward, upward, static, no data, no data	7/21/67, 7/16/68, 9/23/81, 7/21/67, 7/16/68, 9/23/81, 7/8/69, 7/8/69, 7/8/69, 7/8/69, 6/24/70, 6/24/70, no date, no date	9/23/96, 9/23/96, 9/23/96, 8/21/96, 8/21/96, 8/21/96, 9/23/96, 9/23/96, 9/23/96, 9/23/96, 9/23/96, 9/23/96, 7/26/96, 7/26/96
Wagon Box	Wagon Box	static, downward	9/3/81, 9/7/82	9/19/88, 9/19/88
Wahweap	Snow Bench	static, static	8/14/70, 8/14/70	9/27/94, 9/27/94
	Sit Down Bench	upward, static, static	8/13/70, 8/13/70, 9/22/81	9/27/94, 9/27/94, 9/27/94
	Wahweap Bottom	static, upward, upward	8/13/70, 8/13/70, 9/22/81	10/26/94, 10/26/94, 10/26/94
	Smith Run	downward, downward, static	8/14/70, 8/14/70, 9/22/81	9/27/94, 9/27/94, 9/27/94
White Rock	White Rock	static	1970	1979
Willow Gulch	Willow Gulch	static, static	1983, 1983	1993, 1992

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Glossary

GLOSSARY

ACRE-FOOT: The volume (as of irrigation water) that would cover 1 acre to a depth of 1 foot (43,560 cubic feet).

ACTIVE PREFERENCE: The total number of animal unit months of forage that can be licensed.

ADIT: A nearly horizontal passage from the surface by which a mine is entered.

AGATE: A kind of silica consisting mainly of chalcedony in variegated bands or other patterns.

AIR QUALITY: A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

AIR QUALITY CLASS I AND II AREAS: Regions in attainment areas where maintenance of existing good air quality is of high priority. Class I areas are those that have the most stringent degree of protection from future degradation of air quality, such as National Parks. Class II areas permit moderate deterioration of existing air quality, such as lands administered by the Bureau of Land Management (BLM).

ALABASTER: Compact, fine-grained gypsum, white or shaded. Used for ornamental vessels, figures, and other carving.

ALGAE: Class of thallophytes, includes single-celled plants and common seaweeds.

ALLOCATION: Process to specifically assign use between and ration among competing users for a particular area of public land or related waters.

ALLOTMENT: An area allocated for livestock use by one or more qualified grazing permittees including prescribed numbers and kinds of livestock under one plan of management.

ALLOTMENT MANAGEMENT PLAN (AMP): A written program of livestock grazing management including supportive measures, if required. An AMP is designed to attain specific management goals in a grazing allotment and is prepared cooperatively with the permittee(s) or lessee(s).

ALL-TERRAIN VEHICLE (ATV): All-terrain vehicle - 42" width or smaller. A small, amphibious motor vehicle with wheels or tractor treads for traveling over rough ground, snow, or ice, as well as on water.

ALLUVIAL DEPOSIT: Sedimentary matter, such as sand and mud, deposits by flowing water, generally of comparatively recent times.

ALLUVIAL FAN: A cone-shaped deposit of alluvium made by a stream where it runs out onto a level plain or meets a slower stream.

ALTERNATIVE: One of at least two proposed means of accomplishing planning objectives.

ANALYSIS: The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.

ANIMAL UNIT MONTH (AUM): The amount of forage required to sustain the equivalent of 1 cow for 1 month; 1 wild horse for 1 month; or 5 sheep for 1 month; 8.9 deer for 1 month (winter season), 5.8 deer for 1 month (summer season); 9.6 antelope for 1 month; 5.5 bighorn sheep for 1 month; 2.2 burros for 1 month; 1.2 elk for 1 month (winter season) or 2.1 elk for 1 month (yearlong) (usually 800 lbs. of useable air-dried forage).

ANTICLINE: A fold that is convex upward or had such an attitude at some stage of development. A geological upfold opening downward.

GLOSSARY

AQUATIC: Living or growing in or on the water.

AQUIFER: Stratum or zone below the surface of the earth capable of producing water, as from a well. A saturated bed, formation, or group of formations which yield water in sufficient quantity to be of consequence as source of supply. An aquifer acts as a transmission conduit and storage reservoir.

ARCH: A natural opening through a narrow wall or plate of rock.

ARCHAEOLOGY: The scientific study of the life and culture of past, especially ancient, peoples, as by excavation of ancient cities, relics, artifacts, etc.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC): An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life/provide safety from natural hazards.

BADLAND: A region nearly devoid of vegetation where erosion has cut the land into an intricate maze of narrow ravines, and sharp crests and pinnacles, instead of curving hills and valleys of the ordinary type.

BEDLOAD: Soil, rock particles, or other debris rolled along the bottom of a stream by the moving water, as contrast with the "silt load" carried in suspension .

BEDROCK: The solid rock exposed at the surface of the earth or overlain by unconsolidated material such as sand, gravel, clay, or soil.

BIODIVERSITY: The variety of life and its processes, and the interrelationships within and among various levels of ecological organization. Conservation, protection, and restoration of biological species and genetic diversity are needed to sustain the health of existing biological systems. Federal resource management agencies must examine the implications of management actions and development decisions on regional and local biodiversity.

BITUMEN: Any of various mixtures of hydrocarbons such as asphalt, tar, or petroleum.

BRACHIOPOD: A marine, shelled animal with two unequal shells or valves each of which normally is bilaterally symmetrical.

BUTTE: An isolated hill rising abruptly above the surrounding land.

CALCAREOUS: Containing calcium carbonate.

CALICHE: Carbonate-rich horizons developed in soils of semiarid and arid regions. Pedologists call these soil accumulations Bk and K horizons, and these are preferable to the terms caliche or calcrete.

CENOMANIAN-SANTONIAN AGES: Span of geologic ages including Cenomanian, Turonian, Coniacian, and Santonian during Late Cretaceous time, 98 to 84 million years ago.

CEPHALOPOD: A member of the most highly developed class of mollusks that swim by ejecting a jet of water from the mantle cavity through a muscular funnel. Most of those preserved as fossils had straight to symmetrically coiled shells divided into chambers by transverse septa.

CLINKER: Slaggy or vitreous masses of coal ash. Clinkers form the area of naturally burning coal fires and are later exposed by erosion.

COMMUNITY PIT: A mineral materials pit established by the Bureau of Land

GLOSSARY

Management for use by local communities and individuals.

CONCESSIONAIRE: Someone who holds a long term authorization to possess and use public lands to provide recreation facilities and services for a fixed period of time authorized under BLM regulations.

CONCRETION: Spherical to elliptical nodules, harder than the surrounding rock, formed by accumulation of mineral matter (example - iron oxide) after deposition of sedimentary rock.

CONGLOMERATE: A cemented clastic rock containing rounded fragments corresponding in their grade sizes to gravel or pebbles.

CONSULTATION: A meeting to discuss, decide, or plan something.

CORAL: A bottom-dwelling, sessile, marine coelenterate; some are solitary individuals, but the majority grow in colonies; they secret external skeletons of calcium carbonate.

CRINOID: A type of echinoderm consisting of a cup or "head" containing the vital organs, numerous radiating arms, an elongate, jointed stem, and roots by which it attached to the sea bottom while the body, stem, and arms float. Stems are the common part found as fossils.

CRYPTOBIOTIC CRUST: Composed of cyanobacteria, green and brown algae, mosses, and lichens that bind together with soil particles to create a crust.

CRYPTOGAM: A plant that bears no flowers or seeds but propagates by means of spores. Cryptogamic organisms make up a cryptogamic crust or surface on certain soils.

CUBIC FEET PER SECOND (cfs): As a rate of stream flow, a cubic foot of water passing a referenced section in 1 second of time. One cfs flowing for 24 hours will yield 1.983 acre-feet of water.

CULTURAL RESOURCES: Those resources of historical and archaeological significance.

CUMULATIVE IMPACTS: Additional and interactive combinations of activities that are not necessarily individually quantitatively different, but together require different management techniques and applications. Cumulative impacts occur when there are multiple infringements on the same values.

CYANOBACTERIA: Photosynthetic bacteria formerly called blue-green algae.

DIRT BIKE: Non-street legal motorcycle.

DORMANT: In a state of suspended animation; live but not actively growing.

DUNAL POCKET: Areas of limited extent that have collected eolian deposits of local weathering products, mainly of blowing sand. These are semi-stable and support locally adapted plant species.

EASEMENT: A right or privilege one may have on another's land.

ECOSYSTEM: A system made up of a community of animals, plants, and bacteria and its interrelated physical and chemical environment.

ELIGIBLE RIVER SEGMENT: A section of a river that qualifies for inclusion into the National Wild and Scenic River System through determination that it is free-flowing and with its adjacent land area possessing at least one river-related value considered to be outstandingly remarkable.

ENDANGERED SPECIES: Any animal or plant species in danger of extinction throughout all of a significant portion of its range. These species are listed by the United States Fish and Wildlife Service.

ENDEMIC: A species restricted to a given geographical location and which are native to that locale.

GLOSSARY

EPHEMERAL STREAM: A stream that flows only in direct response to precipitation, and whose channel is at all times above the water table.

EQUESTRIAN: Of horses, horsemen, or horseback riding.

EXCLUSION AREA: An environmentally sensitive area where rights-of-way would be granted only in cases where there is a legal requirement to provide such access.

FAULT: A geologic fracture or a zone of fractures along which there has been movement (off set) of one side relative to the other.

FAUNA: The animals of a specified region or time.

FLOODPLAIN: A plain along a river, formed from sediment deposited by floods.

FLORA: The plants of a specified region or time.

FORAGE: Vegetation of all forms available and of a type used for animal consumption.

FORMATION: The primary unit in stratigraphy consisting of a succession of strata useful for mapping or description. Most formations possess certain lithologic features that may indicate genetic relationships.

FOSSIL: The remains or traces of animals or plants which have been preserved by natural causes in the earth's crust exclusive of organisms which have been buried since the beginning of historic times.

FOUR-WHEEL-DRIVE (4WD): Four-wheel-drive, differential transfer case disperses 50/50 front and rear displacement. Trucks, cars, buses, or sport utility vehicles with high clearance and the ability to operate off-pavement as well as on highways.

FUNCTIONING-AT-RISK: Riparian-wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

GASTROPOD: Any if a large class of mollusks having one-piece, straight or spiral shells, as snails, limpets, etc.

GEOLOGY: The science which studies the Earth, the rocks of which it is composed, and the changes it has undergone or is undergoing.

GRAZING ALLOTMENT CATEGORIES: Direction under which all grazing allotments are categorized for management purposes into three groups. The overall objectives are: M-maintain the current resource conditions; I-improve the current resource conditions; and C-custodial manage the existing resource values.

GRAZING PERMIT: An authorization which allows grazing on public lands. Permits specify class of livestock on a designated area during specified seasons each year. Permits are of two types: preference (10 year) and temporary nonrenewable (1 year).

GRAZING PERMIT VALUE: BLM allocated animal unit months may be transferred from one operator to another. The dollar value given by one operator (buyer) to induce a present permit holder (seller) to transfer his permit is known as the "permit value" of an animal unit month. This "permit value" may have a significant bearing on the rancher's capital value.

GRAZING PREFERENCE: The total number (active and suspended non-use) of animal unit months of livestock grazing on public land apportioned and attached to base property owned or controlled by a permittee.

GRAZING SYSTEM: A prescribed method of grazing a range allotment having two or more pastures or management units to provide periodic rest for each unit.

GLOSSARY

GYPSUM: A common soft evaporite mineral (alabaster, selenite, satin spar) used to make plaster of Paris.

HABITAT: A specific set of physical conditions in a geographic area(s) that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

HANGING GARDEN: Small pockets of vegetative associations surrounding "canyon-wall" springs that often contain a wide variety of unique plant and insect species. Hanging gardens are characteristic of flat-lying strata with deeply incised canyons of the Colorado Plateau.

HOMOCLINE: A group of geological strata which have fairly regular dip in the same general direction.

HYDRAULIC: Operated, moved, or effected by means of water.

HYDROCARBON: An organic compound containing only hydrogen and carbon, such as petroleum or crude oil.

HYDROLOGY: The science dealing with the properties, distribution, and circulation of water.

ILMENITE: A mineral of the composition $FeTiO_3$ (iron-titanium-oxide), the principal mineral of titanium ore.

IMPACT: Synonymous with effects. Includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental (adverse) effects. Impacts may be considered as direct, indirect, or cumulative:

- **Direct:** Impacts caused by an action an occurring at the same time and place.
- **Indirect:** Impacts caused by the proposed action and occurring later in time or farther removed in distance, but are still reasonably foreseeable.
- **Cumulative:** Those which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

INHOLDING: A non-Federal parcel of land that is completely surrounded by Federal land.

INSTANT STUDY AREA (ISA): A designation of all primitive or natural areas formally identified prior to November 1, 1975, that were to be studied for wilderness suitability and recommended to the President by July 1, 1980 as mandated under Section 603 of FLPMA.

INTERIM MANAGEMENT POLICY (IMP): An interim measure governing lands under wilderness review. This policy protects Wilderness Study Areas from impairment of their suitability as wilderness.

INTERMITTENT STREAM: Seasonal stream. A stream that flows only at certain times of the year when it receives water from springs or from some surface source, such as melting snow in mountainous areas.

INVERTEBRATE SPECIES: Any animal without a backbone or spinal column.

JASPER: Red, brown, green, impure, slightly translucent cryptocrystalline quartz with a dull fracture.

KIND OR CLASS OF LIVESTOCK:

- **Kind:** The species of domestic livestock-cattle and sheep.
- **Class:** The age class (i.e., yearling or cows) of a species of livestock.

KNOWN GEOLOGIC STRUCTURES: Technically, the known geologic structure of a producing oil or gas field is construed by the Geological Survey to be the trap, whether structural or stratigraphic, in which an

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accumulation of oil or gas has taken place, and the limits of said trap, irrespective of the degree to which it may be occupied by oil or gas. Known geologic structures are frequently much more extensive than the pools of oil or gas they may contain, and the extent and place of any oil or gas accumulation therein, though influenced by structure, is finally determined by such factors as stratigraphy, hydrocarbon supply, sand conditions, and hydrostatic pressure. The Geological Survey seeks to evaluate the net effect of these several factors in terms of reasonably presumptive productive acreage and, as far as practicable, to conform the results, modified to include a fair safety margin, to the subsurface contours of the dominant structural feature involved.

LAND USE PLAN: A plan that reflects an analysis of activity systems and a carefully studied estimate of future land requirements for expansion, growth control, and revitalization or renewal. The plan shows how development in the area should proceed in the future to insure the best possible physical environment for living, the most economic and environmentally sensitive use of land, and the proper balance in use from a cost revenue point of view. The land use plan embodies a proposal as to how land should be used in the future, recognizing local objectives and generally accepted principals of health, safety, convenience, economy, and general living amenities.

LEASE: An authorization or contract by which one party (lessor) conveys the use of property, such as real estate, to another (lessee) in return for rental payments. In the case of oil, gas, and coal leases in the Monument, the U.S. Department of Interior or the Utah School and Institutional Trust Lands Administration are lessors and have conveyed the right to explore and develop these resources to corporations or individuals on various land tracts. In addition to rental payments, lessees also pay royalties (a percentage of value) to the lessor from resource production.

LEASABLE MINERAL: A mineral such as coal, oil shale, oil and gas, phosphate, potash, sodium, geothermal resources, and all other minerals that may be developed under the Mineral Leasing Act of 1920, as amended.

LENTICULAR: Having the shape of a convex lens. In geological descriptions, lenticular is used to describe the shapes of certain bodies of rocks or minerals enclosed by contrasting rock.

LICHEN: Any of various small plants composed of a particular fungus and a particular algae growing in an intimate symbiotic association and forming a dual plant, commonly adhering in colored patches of sponge-like branches to rock, wood, soil, etc.

LIMESTONE: A bedded sedimentary deposit consisting chiefly of calcium carbonate ($CaCO_3$).

LIVERWORT: Any of the plants of two classes of bryophytes, often forming dense, green, moss-like mats on logs, rocks, or soil in moist places.

LOCATABLE MINERAL: Any valuable mineral that is not saleable or leasable including gold, silver, copper, uranium, etc., that may be developed under the General Mining Law of 1872.

MAGNETITE: One of the most widespread oxide minerals with the general formula Fe_3O_4 (iron oxide) found in a number of geological environments including sand grains in beach or river deposits. Magnetite is magnetic with some forms (lodestone) showing polarity.

MESA: A flat-topped mountain or plateau bounded on at least one side by a steep cliff.

METALLIC-MINERAL: A mineral containing one or more metals such as copper [malachite - $Cu_2(CO_3)(OH)_2$], lead [galena - PbS], or zinc [sphalerite - (Zn,Fe)S].

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MIGRATORY: A group of people, or of birds, fishes, or plants that move from one region to another with the change of seasons or climate.

MINERAL ENTRY: The location of mining claims by an individual to protect his/her right to a valuable mineral.

MINERAL MATERIALS: Refer to saleable minerals.

MINERAL POTENTIAL:

- **High:** Those lands currently producing oil or gas or having high current industry interest.
- **Moderate:** Those lands which have had oil and gas shows in favorable geologic environments.
- **Low:** Those lands where either the geologic environment appears to be favorable for the accumulations of oil and gas, or where little or no information is available to evaluate the oil and gas potential.

MINERAL WITHDRAWAL: A withdrawal for public lands which are potentially valuable for leasable minerals. This precludes the disposal of the lands except with a mineral reservation, or unless the lands are found to not be valuable for minerals.

MINIMUM IMPACT FILMING: A filming activity which does not involve:

- impact to sensitive habitat or species
- impact to Native American Indian sacred sites
- use of explosives or major use of pyrotechnics
- more than minimum impacts to land, air, or water
- use of exotic species with danger of introduction into the area
- adverse impacts to sensitive surface resources including historic, cultural, or paleontological sites; sensitive soils; relict environments; wetlands or riparian areas; or ACECs
- use of heavy equipment

In addition, if filming activity is proposed to occur in a Wilderness Study Area, Wild and Scenic River corridor, HR 1500 area, or National Historic Register Site, to be "minimum impacting", none of the following can occur:

- use of vehicles off designated routes
- set construction
- significant restriction of public access
- significant use of domestic livestock
- aircraft taking off, landing, or flying less than 1,000 feet above the site
- 15 or more production vehicles, or 75 or more people
- continue in excess of 10 days

MITIGATING MEASURES: Constraints, requirements, or conditions imposed to reduce the significance of or eliminate an anticipated impact to environmental, socioeconomic, or other resource value from a proposed land use. Committed mitigating measures are those measures BLM is committed to enforce (i.e., all applicable laws and their implementing regulations).

MOLLUSK: A member of the phylum of invertebrate animals which includes the gastropods, pelecypods (bivalves), cephalopods, etc.

MONAZITE: A widespread rare-earth mineral containing thorium $[(Ce,La,Y,Th)PO_4]$, which is commonly found in igneous and metamorphic rocks and sedimentary deposits derived from them.

MONOCLINE: A step-like bend in otherwise horizontal beds.

MOSS: Any of various classes of very small, green bryophytes having stems with leaflike structures and growing in velvety clusters on rocks, trees, moist ground, etc.

MOUNTAIN BICYCLE: Bicycle designed for off-pavement use. Generally are multi-geared with fat knobby tires. Frames and tire rims are stronger than road bicycles. Sometimes referred to in this document as a mechanized vehicle.

NATIONAL WILD AND SCENIC RIVERS SYSTEM: Established by the Wild and Scenic Rivers Act of 1958 to protect rivers and their immediate environments that have outstanding scenic, recreation, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in free-flowing conditions. The system provides for the designation of three types of rivers:

- **Recreation:** Rivers or sections of rivers readily accessible by road or railroad that may have some development along their shorelines and may have undergone some impoundment or diversion in the past.
- **Scenic:** Rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely undeveloped, but accessible in places by road.
- **Wild:** Rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with essentially primitive watersheds or shorelines and unpolluted waters.

NATURALNESS: An area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." (Section 2c, WILDERNESS ACT).

NON-FUNCTIONING: Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows.

NONVASCULAR PLANT: Plants that do not have specialized tissues for conducting water and synthesizing foods, as any moss or liverwort.

OFF-HIGHWAY VEHICLES (OHV): Any motorized vehicle designed for or capable of cross-country travel over lands, water, sand, snow, ice, marsh, swamp-land, or other terrain.

OFF-HIGHWAY VEHICLE DESIGNATIONS:

- **Open:** Designated areas and trails where OHVs may be operated.
- **Limited:** Designated areas and trails where the use of an OHV is subject to restrictions, such as limiting the dates and times of use (seasonal restrictions); limiting use to designated roads and trails; limiting use to existing roads and trails. Combinations of restrictions are possible.
- **Closed:** Designated areas, roads, and trails where the use of an OHV is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

OUTCROPPING: The exposure of bedrock or strata projecting through the overlying cover of detritus and soil.

OUTSTANDING: Standing out among others of its kind; distinguished; excellent.

OUTSTANDING NATURAL AREA (ONA): These are established to preserve scenic values and areas of natural wonder. The preservation of these resources in their natural condition is the primary management objective. Access roads, parking areas, and public use facilities are normally located on the periphery of the area. The public is encouraged to walk into the area for recreation purposes wherever feasible.

PALEONTOLOGY: The branch of geology that deals with life forms from the past, especially prehistoric life forms, through the study of plant and animal fossils.

PELECYPOD: Mollusks distinguished by a calcareous two-valve shell (clams). Also called bivalves.

PERCHED WATER TABLE: Water table above an impermeable bed underlain by unsaturated rocks of sufficient permeability to allow movement of ground water.

PERENNIAL STREAM: A Stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

PERMIT: A short-term, revocable authorization to use public lands for specific purposes.

PERMITTEE: (Livestock Operator) A person or organization legally permitted to graze a specific number and class of livestock on designated areas of public land during specified seasons each year.

PETRIFIED WOOD: Fossilization of wood through introduction or replacement by silica (silicified wood) in such a manner that the original form and structure of the wood is preserved.

PHYSIOGRAPHIC REGION: Region of similar geologic structure and climate with a unified history of land formation.

PLACER DEPOSIT: A mass of gravel, sand, or similar material derived from weathering and erosion of bedrock. These masses often contain of heavy mineral grains concentrated due to the action of water.

PLATEAU: An elevated, relatively flat region commonly limited on at least one side by an abrupt descent to lower land.

POTENTIOMETRIC SURFACE: A ground-water term relating to the contoured (mapped) surface showing the distribution of hydraulic head within a particular aquifer. In an unconfined aquifer, the potentiometric surface is the water table. In a confined aquifer the potentiometric surface illustrates how high water would rise in wells that penetrate the aquifer.

PRESCRIBED FIRE: Controlled application of fire to natural fuels under conditions of weather, fuel moisture, and soil moisture that will allow confinement of the fire to a predetermined area and, at the same time, will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives to wildlife, livestock, and watershed values. The overall objectives are to employ fire scientifically to realize maximum net benefits at minimum environmental damage and acceptable cost.

PREY SPECIES: An animal taken by a predator as food.

PROPERLY FUNCTIONING CONDITION (PFC): Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment; capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity.

RANGELAND IMPROVEMENTS: Any activity or program on or relating to rangelands that is designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include land treatments (e.g., chaining, seeding, burning, etc.), stockwater developments, fences, and trails.

RAPTORS: Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.

RECLAMATION: (1) The process of restoring land disturbed as a result of some human activity to nearly its original state through contouring and seeding. (2) A type of withdraw in which public lands are or may be needed in connection with the construction and maintenance of a water development or

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irrigation project of the Bureau of Reclamation.

RECREATION AND PUBLIC PURPOSES ACT (R&PP): The Act of June, 1926, as amended (43 U.S.C. 869,869-4). Allows the disposal of public lands to any state, local, federal, or political instrumentality or nonprofit organization for any recreational or public purpose, at the discretion of the authorized officer.

RECREATION OPPORTUNITY SPECTRUM (ROS) CLASSES: See Appendix 20 for a description of ROS classes.

RELICT PLANT COMMUNITY: Areas of plants that have persisted despite the pronounced warming and drying of the interior west over the last few thousand years and/or have not been influenced by settlement and post-settlement activities.

RESEARCH NATURAL AREA (RNA): A natural area established and maintained for research and education, which may include:

- typical or unusual plant or animal types, associations, or other biotic phenomena
- characteristic or outstanding geologic, soil, or aquatic features or processes.

The public may be excluded or restricted from such areas to protect studies.

RIGHT-OF-WAY: The Federal land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a ROW authorization.

RIPARIAN HABITAT: Riparian habitat is defined as an area of land directly influenced by permanent (surface of subsurface) water. They have visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream-banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

RIPARIAN VEGETATION: Plants adapted to moist growing conditions along streams, waterways, ponds, etc.

RIP-RAP: A placement of stone, rock, or similar material that is placed on an embankment slope in order to prevent or arrest erosion

ROUTE: A path, way, trail, road, or other established travel corridor.

RUTILE: A titanium mineral [TiO_2] widespread as an accessory in igneous and metamorphic rocks. It is also common in beach sands.

SALEABLE MINERALS: Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are common varieties of sand, stone, gravel, and clay.

SANDSTONE: A cemented or otherwise compacted detrital sediment composed predominantly of sand-grade size quartz grains.

SEASON-OF-USE: The time of livestock grazing on a rangeland area.

SEDIMENTARY: Descriptive term for rocks formed of sediment. This includes clastic rocks such as conglomerate, sandstone, and shale formed from fragments of other rocks transported by the action of wind or water from their source. The term also includes rocks formed by inorganic precipitation from solution such as gypsum and limestone, or from secretions from living organisms as in the case of some limestone.

SEDIMENTOLOGICAL: Refers to the study of sedimentary rocks (sedimentology) and the processes by which they are formed.

SENSITIVE SPECIES: Species not yet officially listed but that are undergoing status review for listing on the Fish and Wildlife Service official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

SEPTARIAN NODULES: A type of concretion in sedimentary rocks consisting of an irregular polygonal system of internal cracks, which are most always occupied by calcite or other minerals.

SILICATE: A group of minerals in which the crystal lattice contains SiO$_4$ (silicon-oxygen) tetrahedra either isolated or joined by one or more of the oxygen atoms to form groups, chains, sheets, or 3-D structures.

SILTSTONE: A very fine-grained, clastic rock composed predominantly of particles of silt grade.

SPECIAL STATUS SPECIES: Wildlife and plant species either Federally listed or proposed for listing as endangered or threatened; state-listed or BLM determined priority species.

STRATA: The plural form of stratum, which is a single sedimentary layer or bed, regardless of thickness.

STRATIGRAPHY: The branch of geology which treats the formation, composition, sequence, and correlation of stratified rocks as part of the Earth's crust.

STRATUM: A single sedimentary bed or layer, regardless of thickness.

STREET LEGAL MOTORCYCLE: Utah law defines this as a motorcycle which has a tail light, headlight, turn signal, and is registered.

SUBSTRATA: Layers of earth or rock lying beneath soil or other layers (strata).

SURFICIAL DEPOSIT: Unconsolidated, residual alluvial or glacial deposits lying on bedrock.

SUSPENDED: Term used when describing an administrative state of mining operations or oil, gas, and mineral leases, whereby the operation or lease is "suspended" or on standby while an administrative action is contemplated. When mineral leases are suspended, the lessee cannot explore, develop, or otherwise enjoy the benefits of the lease. Also, the term (time period) of the lease is suspended.

SYNCLINE: A geological downfold opening upward.

TAR SAND: A commonly used name to describe a sedimentary rock reservoir impregnated with a very heavy, viscous crude oil which cannot be produced by conventional production techniques. Tar-sand infers a sandy sedimentary rock as the host, but this is not always the case as other porous rocks such as siltstone and fractured carbonates have also been classified as tar-sand.

TAXONOMIC: The classification of biological organisms.

TERRESTRIAL: Growing or living on land rather than in water, in the air, in trees, etc.

THREATENED SPECIES: Any animal or plant species likely to become endangered within the foreseeable future throughout all of a significant portion of its range. These species are listed by the FWS.

TINAJAS: Surface depressions in rock formations, particularly sandstone, that collect water and provide habitat for specialized plant and animal species.

TITANIUM: A gray, light and strong metallic chemical element used in metal alloys. Alloys of titanium are used in aerospace and other applications where high strength-to-weight ratios are required.

TOPOGRAPHY: The accurate and detailed description of a place.

TOTAL DISSOLVED SOLIDS (TDS): The total quantity (reported in milligrams per liter) of dissolved materials in water.

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TREND IN RANGE CONDITION: An interpretation of the direction of change in range condition. These determinations may relate to ecological site or forage conditions. Also vegetation trend that is improving (upward) not changing (static) and declining (downward).

TWO-WHEEL-DRIVE (2WD): Vehicle clearance generally lower than with a 4WD. Not designed to travel off-pavement.

UTILITY: A service provided by a public utility, such as electricity, telephone, or water.

VANADIUM: A soft, ductile chemical element used to form iron and steel alloys.

VEGETATION TREATMENT: Changing the characteristics of an established vegetation type for the purpose of improving rangeland forage or wildlife habitat resources. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods alter the vegetation by chaining, spraying with pesticides, burning, and plowing, followed by seeding with well adapted desirable plant species.

VERTEBRATE SPECIES: Any animal with a backbone or spinal column.

VISITOR DAY: Twelve visitor hours which may be aggregated by one or more persons in single or multiple visits.

VISITOR USE: Visitor use of a resource for inspiration, stimulation, solitude, relaxation, education, pleasure, or satisfaction.

VISUAL RESOURCE MANAGEMENT (VRM) CLASSES: Management classes are determined on the basis of overall scenic quality, distance from travel routes, and sensitivity to change.

- **Class I:** Provides primarily for natural ecological changes only. It is applied to wilderness areas, some natural areas, and similar situations where management activities are to be restricted.
- **Class II:** Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
- **Class III:** Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
- **Class IV:** Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape.

WATERSHED: All land and water within the confines of a drainage divide.

WETLANDS: Lands including swamps, marshes, bogs, and similar areas, such as wet meadows, river overflows, mud flats, and natural ponds.

WILD AND SCENIC RIVERS: See National Wild and Scenic River System.

WILDERNESS AREA: An area officially designated as wilderness by Congress. Wilderness areas will be managed to preserve wilderness characteristics and shall be devoted to "the public purposes of recreation, scenic, scientific, educational, conservation, and historical use."

WILDERNESS STUDY AREA (WSA): Areas under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System.

WILDFIRE: A free-burning fire requiring a suppression response.

WITHDRAWAL: Removal or "withholding" of public lands from operation of some or all of the public land laws (settlement, sale, mining, and/or mineral leasing). An action which restricts the use or disposal of public lands, segregating the land from the operation of some or all of the public land and/or mineral laws and holding it for a specific public purpose. Withdrawals may also be used to transfer jurisdiction of management to other Federal agencies.

WOODLAND: Forest lands stocked with other than timber species (i.e., piñon, juniper, mountain mahogany, etc.). Uses of the woodland products are generally limited to firewood, posts, and harvest of piñon pine nuts.

ZIRCON: A mineral [$ZrSiO_4$] used as a refractory and as the gem, hyacinth. The chief ore-mineral of zirconium, and a common accessory mineral in igneous rocks. Because zircon is resistant to mechanical and chemical weathering, it can occur as a detrital (sand grains) mineral in river and beach sands.

References

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REFERENCES

Albee, Beverly J., Leila M. Schultz, Sherel Goodrich. 1988. *Atlas of the Vascular Plants of Utah*. Salt Lake City: Utah Museum of Natural History.

Allin, D.L 1993. Upper Valley, in Hill, B.G., and Bereskin, S.R., editors, Oil and gas fields of Utah: *Utah Geological Association Publication* 22, non-paginated.

Atwood, N. Duane, Clyde L. Pritchett, Richard D. Porter and Benjamin W. Wood. 1980. Terrestrial Vertebrate Fauna of the Kaiparowits Basin. *Great Basin Naturalist* Vol. 40, No. 4 (December 1980): 303.

Atwood, N.D., J. Holland, R. Bolander, M.A. Franklin, D.E. House, V.A. Armstrong, K.H. Thorne, J.L. England. 1991. *Utah threatened, endangered, and sensitive plant field guide.* USDA Forest Service, Intermountain Region, Ogden, UT.

Baker, A.A., Duncan, D.C., and Hunt, C.B. 1952. Manganese deposits of southeastern Utah: *U.S. Geological Survey Bulletin* 979-B., 157 p.

Barneby, R.C. 1989. *Intermountain Flora,* vol. 3B: Fabales. Bronx: New York Botanic Garden. 279 pp.

Belnap, J. K.T. Harper, and S.D.Warren. 1994. *Surface disturbance of cryptobiotic soil crusts: nitrogenase activity, chlorophyll content, and chlorophyll degradation.* Arid Soil Research and Rehabilitation.

Betencourt, J. 1984. Late Quaternary plant zonation and climate in southeastern Utah. *Great Basin Naturalist* 44: 1-32.

Blanchard, Paul. 1986. Ground-water Conditions in the Kaiparowits Plateau Area, Utah and Arizona, with Emphasis on the Navajo Sandstone. *State of Utah, Department of Natural Resources Technical Publication* 81, 87 p.

Boettinger, J. and J.D. Sipes. 1998. Soil properties influence the distribution of Jones cycladenia *(Cycladenia humilis var jonesii)*, a rare endemic plant of the Colorado plateau. In the science symposium proceedings.

Bowers, W.E. 1972. The Canaan Peak, Pine Hollow, and Wasatch Formations in the Table Cliff Region, Garfield County, Utah: *U.S. Geological Survey Bulletin* 1331-B.

Brunson, Mark W. and Blahna, Dale J. 1997. *Progress Report: Assessing Low-Impact Recreation Behaviors and Attitudes in Desert Wilderness Areas.* Utah State University, January 31, 1997.

Buranek, A.M. 1945. Notes on the Manganese King property near Kanab, Kane County, Utah: *Utah Department of Publicity and Industrial Development* Circular 33, 11 p.

Butler, B.S., Loughlin, G.F., Heikes, V.C. et. al. 1920. The Ore Deposits of Utah: *U.S. Geological Survey Professional Paper* 111, 672 p.

Carter, L. M. H., and Sargent, K. A. 1983 (1984). Scenic features related to geology in the Kaiparowits Plateau area, Utah: *U.S. Geological Survey Miscellaneous Investigations Map* I-1033-K, scale 1:125,000.

Cifelli, R.L. 1990a. Cretaceous mammals of southern Utah, I: Marsupials from the Kaiparowits Formation (Judithian): *Journal of Vertebrate Paleontology*, v. 10, no. 3, p. 295-319.

Cifelli, R.L. 1990b. Cretaceous mammals of southern Utah, II: Marsupials and marsupial-like mammals form the Wahweap Formation (early Campanian): *Journal of Vertebrate Paleontology*, v. 10, no. 3, p. 320-331.

Cifelli, R.L. 1990c. Cretaceous mammals of southern Utah, III: Therian mammals from the Turonian (early Late Cretaceous): *Journal* *of Vertebrate Paleontology*, v. 10, no.3, p. 332-345.

Cifelli, R.L. 1990d. Cretaceous mammals of southern Utah, IV: Eutherian mammals from the Wahweap (Aquilian) and Kaiparowits (Judithian) Formations: *Journal of Vertebrate Paleontology*, v. 10, no. 3, p. 346-360.

Cifelli, R.L. and Eaton, J.G., 1987. Marsupial from the earliest Late Cretaceous of the western U.S.: *Nature*, v. 265, no. 6104, p. 520-522.

Cifelli, R.L., and Johanson, Zerina. 1994. New Marsupial from the Upper Cretaceous of Utah: *Journal of Vertebrate Paleontology*, v. 14, no. 2, p. 292-295.

Cifelli, R.L., and Madsen, S.K. 1986. An Upper Cretaceous symmetrodont (Mammalia) from southern Utah: *Journal of Vertebrate Paleontology*, v. 6, no.3, p. 258-263.

Cobban, W.A. 1993. Diversity and distribution of Late Cretaceous ammonites, Western Interior, United States, *in* Caldwell, W.G.E., and Kauffman, E.G., editors, *Evolution of the Western Interior Basin: Geological Association of Canada Special Paper 39*, p. 435-451.

Cronquist, A. 1994. *Intermountain flora, vol. 5: Asterales*. Bronx: New York Botanic Garden. 496 pp.

Cronquist, A., A.H. Holrngren, N.H. Holmgren, and J.L. Reveal. 1972. *Intermountain flora, vol. 1: geological and botanical history of the region, its plant geography and glossary. The vascular cryptogams and the gymnosperms*. New York: Hafner. 270 pp.

Cronquist, A., A.H. Holmgren, N.H. Holmgren, J.L. Reveal and P.K. Holmgren. 1977. *Intermountain flora, vol. 6: Monocotyledons*. New York: Columbia Univ. Press. 584 pp.

Cronquist, A., A.H. Holmgren, N.H. Holmgren, J.L. Reveal and P.K. Holmgren. 1984. *Intermountain flora, vol. 4: Subclass Asteridae (except Asteraceae)*. Bronx: New York Botanic Garden. 573 pp.

Cronquist, A., N.H. Holmgren, and P.K. Holmgren. 1997. *Intermountain flora, vol. 3A: Subclass Rosidae (except Fabales)*. Bronx: New York Botanic Garden. 446 pp.

Davidson, E.S. 1967. Geology of the Circle Cliffs areas. Garfield and Kane counties, Utah: *U.S. Geological Survey Bulletin* 1229, 140 p.

Doelling, Hellmut H. 1975. Geology and mineral resources of Garfield County, Utah: *Utah Geological and Mineralogical Survey Bulletin* 107, 175 p.

Doelling, Hellmut H., Davis, Fitzhugh D., and Brandt, Cynthia J. 1989. The geology of Kane County, Utah--Geology, mineral resources, geologic hazards: *Utah Geological and Mineral Survey Bulletin* 124 and Map 121, 192 p., 10 pls., scale 1:100,000.

Doelling, Hellmut H. and Graham, R. L. 1972. Southwestern Utah coal fields -- Alton, Kaiparowits Plateau and Kolob-Harmony: *Utah Geological and Mineralogical Survey Monograph* I, 333 p.

Dow, V.T., and Batty, J.V. 1961. Reconnaissance of titaniferous sandstone deposits of Utah, Wyoming, New Mexico and Colorado: *U.S. Bureau of Mines Report of Investigation* 5860, 51 p.

Eaton, J.G. 1987a. *Stratigraphy, depositional environments, and age of Cretaceous mammal-bearing rocks in Utah, and systematics of the Multituberculata*. Boulder, University of Colorado, Ph.D. dissertation, 315 p.

Eaton, J.G. 1987b. Biostratigraphic framework for Late Cretaceous nonmarine sequence, Kaiparowits Plateau, southern Utah

REFERENCES

[abs.]: *Geological Society of America, 1987 Annual Meeting, Phoenix, Arizona, Abstracts with Programs*, v. 19, p. 650-651.

Eaton, J.G. 1988. Cretaceous multituberculates (Mammalia) from Utah [abs.]: *Abstracts of the 48th Annual Meeting of the Society of Vertebrate Paleontology*, no. 40, p. 13A-14A.

Eaton, J.G. 1991. Biostratigraphic framework for Upper Cretaceous rocks of the Kaiparowits Plateau, southern Utah *in* Nations, J.D., and Eaton, J.G., editors, Stratigraphy, depositional environments, and sedimentary tectonics of the western margin, Cretaceous Western Interior Seaway: *Geological Society of America Special Paper 260*, P. 47-63.

Eaton, J.G. 1993a. Therian mammals of the Cenomanian (Late Cretaceous) Dakota Formation, southwestern Utah: *Journal of Vertebrate Paleontology*, v. 13, p. 105-124.

Eaton, J.G. 1993b. Mammalian paleontology and correlation of uppermost Cretaceous rocks of the Paunsaugunt Plateau, Utah, *in* Aspects of Mesozoic geology and Paleontology of the Colorado Plateau: *Museum of Northern Arizona Bulletin 59*, p. 163-180.

Eaton, J.G. 1995. Cenomanian and Turonian (early Late Cretaceous) multituberculate mammals from southwestern Utah: *Journal of Vertebrate Paleontology*, v. 15, p. 761-784.

Eaton, J.G., and Cifelli, R.L. 1988. *Preliminary report on Late Cretaceous mammals of the Kaiparowits Plateau, southern Utah: Contributions to geology*, University of Wyoming, v. 26, no. 2, p. 45-55.

Eaton, J.G., and Nations, J.D. 1991. Introduction: Tectonic setting along the margin of the Cretaceous Western Interior Seaway, southwestern Utah and northern Arizona, *in* Nations, J.D., and Eaton, J.G., editors, Stratigraphy, depositional environments, and sedimentary tectonics of the western margin, Cretaceous Western Interior Seaway: *Geological Society of America Special Paper 260*, P. 47-63.

Eaton, J.G., Kirkland, J.I., Gustason, E.R., Nations, J.D., Granczyk, K.J., Ryer, T.A., and Carr, D.A. 1987. Stratigraphy, Correlations, and tectonic setting of the Late Cretaceous rocks in the Kaiparowits and Black Mesa Basins *in* Davis, G.H., and VanderDolder, E.M. (Editors), Geologic diversity of Arizona and its margins. Excursions to choice areas: Geological Society of America, 100th annual meeting field Trip guidebook, *Arizona Bureau of Geology and Mineral Technology Special Paper 5*, p. 113-135.

Eaton, J.G., Kirkland, J.I., Hutchison, J.H., Denton, R., O'Neill, R.C., and Parrish, J.M. 1997. Nonmarine extinction across the Cenomanian-Turonian (C-T) boundary, southwestern Utah, with a comparison to the Cretaceous-Tertiary (K-T) extinction Event: *Geological Society of America Bulletin*, v. 109, no. 5, p. 560-567.

Freethy, Geoffrey W. 1997. Hydrogeology of the Grand Staircase-Escalante National Monument [Abs]: *Learning From the Land*, a science symposium sponsored by the Bureau of Land Management and the Governor's Office of Planning and Budget, November 4-5, 1997, Cedar City, Utah.

Gillette, David D. and Hayden, Martha C. 1997. A preliminary inventory of paleontological resources within the Grand Staircase-Escalante National Monument, Utah: *Utah Geological Survey Circular* 96, 34 p.

Gregory, H.E., and Moore, R.C. 1931. The Kaiparowits region, a geographic and geologic reconnaissance of parts of Utah and Arizona: *U.S. Geological Survey Professional Paper* 164, 161 p.

REFERENCES

Grover, Lenore R. 1990. *Coyote Gulch Campsite Survey 1990.* Division of Resource Management Glen Canyon National Recreation Area. September 21, 1990.

Hansen, D.E. 1978a. Map showing extent and total thickness of coal beds in the Kaiparowits coal basin, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-C, scale 1:125,000.

Hansen, D.E. 1978b. Maps showing amount of overburden on major coal zones in the Kaiparowits coal basin, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-D, scale 1:125,000.
Harper 1994.

Haven, R. and Agey, W.W. 1949. Concentration of manganese ores from Piute and Kane Counties, southern Utah: *U.S. Bureau of Mines Report of Investigation 4551*, 9 p.

Heath, Steven H. 1997. *A Historical Sketch of the Scientific Exploration of the Region Containing the Grand Staircase-Escalante National Monument.* Paper presented to Conference on the Grand Staircase - Escalante National Monument, November 1-5, 1997, Cedar City, Utah.

Hecox, Walter E and Ack, Bradley L. 1996. *Charting the Colorado Plateau: An Economic and Demographic Exploration*. Grand Canyon Trust.

Hettinger, R.D., McCabe, P.J., and Shanley, K.W. 1994. Detailed facies anatomy of transgressive and highstand systems tracts from the Upper Cretaceous of southern Utah, U.S.A., *in* Posamentier, H.W., and Weimer, P., eds., Recent advances in siliciclastic sequence stratigraphy: *American Association of Petroleum Geologists Memoir 58*, p. 235-257.

Hettinger, Robert D. 1995. Sedimentological descriptions and depositional interpretations, in sequence stratigraphic context, of two 300-m cores from the Upper Cretaceous Straight Cliffs Formation, Kaiparowits Plateau, Kane County, Utah: *U.S. Geological Survey Bulletin* 2115-A, 32 p.

Hettinger, Robert D., Roberts, Laura N.R., Biewick, Laura R.H., and Kirschbaum, Mark A. 1996. Preliminary investigations of the distribution and resources of coal in the Kaiparowits Plateau, southern Utah: *U.S. Geological Survey Open-File Report* 96-539, 72 p., 1 pl.

Holden, Paul B. 1974. Distribution and Abundance of the Fishes of The Lower Escalante River, Utah.(1974) 1-10

Jackson, Jennifer G. and Herder, Michael J. 1997. Baseline Bat Inventory of Southern Utah Using Mist Nets and Ultrasonic Detectors. *Publication No. 97-10 Utah Division of Wildlife Resources* (September 1997) 13-20.

Kirkland, J.L. 1987. Upper Jurassic and Cretaceous lungfish toothplates from the Western Interior, last dipnoan faunas of North America: *Hunteria*, v. 2, p. 1-16.

Klimack, Paul W. and Messmer, Terry A. 1996. *Paunsaugunt Plateau/Buckskin Mountain Mule Deer Herd Study*.

Lawson, A.C. 1913. The gold of the Shinarump at Paria: *Economic Geology*, v. 8, p. 434-446.

LeFevre, Lenora H. 1973. *The Boulder Country and Its People.* Springville, Utah:Art City Publishing.

Lidke, K.J. and Sargent, K.A. 1983. Geologic cross sections of the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-J, scale 1:125,000.

McCabe, P.J., and Shanley, K.W. 1992. An organic control on shoreface stacking patterns. Bogged down in the mire: *Geology*, v. 20, p. 741-744.

REFERENCES

Murdock, Joseph R., Welsh, Stanley L., and Benjamin W. Wood. 1971-1974. *Navajo-Kaiparowits Environmental Baseline Studies, Summary Report.* Center for Health and Environmental Studies and Botany and Range Science Department, BYU.

Parrish, J.M., and Eaton, J.G. 1991. Diversity and evolution of dinosaurs in the Cretaceous of the Kaiparowits Plateau, Utah [abs.]: *Journal of Vertebrate Paleontology*, v. 11, supplement to no.3, p. 50A.

Peterson, Cordell L. And O'Neill, Deborah. 1997. Southwestern Willow Flycatcher Occurrence and Habitat in the Escalante river, Kanab Creek, and Paria River Drainage in 1997. *Publication Number 97-12 Utah Division of Wildlife Resources* (1997)

Peterson, Fred. 1969. Four new members of the upper Cretaceous Straight Cliffs Formation in the southeastern Kaiparowits region Kane County, Utah: *U. S. Geological Survey Bulletin* 1274-J, p. J1-J28.

Phillips, C.H. 1985. Intermountain gold anomaly -- significance and potential: *Engineering and Mining Journal*, v. 186, May, p. 34-38.

Presidential Proclamation 6920 of September 18, 1996. Establishment of the Grand Staircase-Escalante National Monument, as published in *Federal Register* Vol. 61, No. 186 (50223-50227), Tuesday, September 24, 1996.

Price, Don. 1977a. Map showing general chemical quality of ground water in the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-A, scale 1:125,000.

Price, Don. 1977b. Map showing general availability of ground water in the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-B, scale 1:125,000.

Price, Don. 1978. Map showing principal runoff-producing areas, and selected streamflow data in the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-E, scale 1:125,000.

Price, Don. 1979. Map showing general chemical quality of surface water in the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-F, scale 1:125,000.

Ritzma, H.R. 1979. Oil-impregnated rock deposits of Utah: *Utah Geological and Mineral Survey Map 47*, scale 1:750,000.

Ritzma, H.R. 1980. Oil-impregnated sandstone deposits, Circle Cliffs Uplift, Utah; in Picard, M.D., editor, Henry Mountains Symposium, Guidebook: *Utah Geological Association Publication 8*, p. 343-351.

Ruehrwein, Joseph J. 1998. *Exploring Knowledge, Attitudes and Reported Behavior of Southern Utah Back-Country Recreationists.* Utah State University.

Sargent, Kenneth A., and Hansen, Dan E. 1980. Landform map of the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-G, scale 1:125,000.

Sargent, Kenneth A., and Hansen, Dan E. 1982. Bedrock geologic map of the Kaiparowits coal basing area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-I, scale 1:125,000.

Shanley, K.W., and McCabe, P.J. 1991. Predicting facies architecture through sequence stratigraphy. An example from the Kaiparowits Plateau, Utah: *Geology*, v. 19, p. 742-745.

REFERENCES

Shanley, K.W., McCabe, P.J., and Hettinger, R.D. 1992. Tidal influence in Cretaceous fluvial strata from Utah, U.S.A. A key to sequence stratigraphic interpretation: *Sedimentology*, v. 39, p. 905-930.

Sharp, G.C. 1976. Reservoir variations at Upper Valley field, Garfield County, Utah, in Hill, J. Gilmore, editor, Symposium on the geology of the Cordilleran Hingeline: *Rocky Mountain Association of Geologists Guidebook*, p. 325-344.

Smith, Arthur D., Donald M. Beale. 1980. Antelope in Utah. *Utah Division of Wildlife Publication No. 80-13.*

Spence, J.R. 1994. *Demography and monitoring of the threatened* Cycladenia jonesii *Eastwood (Apocynaceae), Glen Canyon National Recreation Area.* National Park Service report.

Stokes, Wm. Lee. 1973. *Scenes of the Plateau Lands and How They Came To Be.* Salt lake City: Publishers Press.

Webb, Robert H. 1985. *Late Holocene flooding on the Escalante River, south-central Utah*: University of Arizona, PhD Thesis, 204 p.

Webb, Robert H., Spence S. Smith, and V. Alexander S. McCord. 1992. *Historic Channel Change of Kanab Creek.* Grand Canyon: Grand Canyon Natural History Association.

Welsh, S.L. and C.A. Toft. 1981. Biotic communities of hanging gardens in southeastern Utah. *National Geographic Society Research Reports* 13:663-681.

Welsh, S.L. N.D. Atwood, S. Goodrich and L.C. Higgins. 1993. *A Utah Flora*. Provo: Life Science Museum, BYU 986 pp.

Welsh, S.L. N.D. Atwood, and J.L. Reveal. 1975. Endangered, threatened, extinct, endemic and rare plants or restricted Utah vascular plants. *Great Basin Naturalist* 35: 327-376.

Welsh, S.L. N.D. Atwood, and J.R. Murdock. 1978. Kaiparowits flora. *Great Basin Naturalist* 38: No. 2, 125-179

Williams, J.D. 1995. *Microbiotic Crusts: A Review*. 55p. Contract Report.

Williams, Van S. 1985. Surficial geologic map of the Kaiparowits coal-basin area, Utah: *U.S. Geological Survey Miscellaneous Investigations Series Map* I-1033-L, scale 1:125,000.

Five County Association of Governments. 1996. *Consolidated Plan: Housing Element.*

County Association of Governments. 1996. *Consolidated Plan: Community Development Element.*

Five County Association of Governments. 1996. *Consolidated Plan: Overall Economic Development Program.*

Five County Association of Governments. 1998. *Consolidated Plan Update 1998-1999.*

Garfield County, Utah. *Garfield County, Utah General Plan.* 1995. Five County Association of Governments.

Kane County, Utah. *Kane County, Utah General Plan.* 1995. Five County Association of Governments.

Utah Governor's Office of Planning and Budget. 1997. *Kane and Garfield County Data.*

Utah Governor's Office of Planning and Budget. 1997. *1997 Economic Report to the Governor.*

Utah Governor's Office of Planning and Budget. 1998. *1998 Economic Report to the Governor.*

Utah Department of Workforce Services. 1997. *Utah's Southwestern District Quarterly Newsletter.*

REFERENCES

United States Bureau of the Census. 1991. *1990 Census of Population and Housing: Summary File Tape 1A.*

United States Bureau of the Census. 1992. *1990 Census of Population and Housing: Summary File Tape 3A.*

United States Bureau of the Census. 1992. *USA Counties.*

United States Bureau of the Census. 1997. *1992 Economic Census.*

United States Bureau of the Census. 1995. *County Business Patterns 1992&1993.*

United States Bureau of the Census. 1992. *Census of Agriculture.*

United States Economics and Statistics Administration. 1997. *Regional Economic Information System:* 1969-1995.

U.S.D.A. Natural Resources Conservation Service. 1997. *Introduction to Microbiotic Crusts.*

U.S. Department of Interior, Bureau of Land Management. January 1997. *Partners Against Weeds, Final Action Plan for the Bureau of Land Management.*

U.S. Department of Interior, Bureau of Land Management. Instruction Memorandum No: 96-67. *Mitigation and Planning Standards for the Management of Paleontological Resources on Public Lands.* (Section V. Deals with Paleontological Resources in Wilderness Areas.) Planning and Mitigation Standards for Paleontological Resources on Public Lands: A Decision maker's Guide. Describes standards, guidelines and procedures for implementing policies identified in the preceding section for the management of paleontological resources on Public Lands administered by the Bureau of Land Management (BLM). 1996a.

U.S. Department of Interior, Bureau of Land Management. Instruction Memorandum No: 96-175. *Handling Requests for Paleontological Locality Information.* 1996b.

U.S. Department of Interior, Bureau of Land Management. Instruction Memorandum No: 96-177. *Paleontology . Announces a partnership agreement with the Society of Vertebrate Paleontology (SVP) for access to SVP information and technical expertise.* 1996c.

U.S. Department of Interior, Bureau of Land Management. *Reference Manual 2800 Rights-of-Way.*

U.S. Department of Interior, Bureau of Land Management, Service Center, Denver, CO. 1994. *Technical Reference 1737-11, Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas.*

U.S. Department of Interior, Bureau of Land Management, Service Center, Denver, CO. 1993, Revised 1995. *Technical Reference 1737-9, Process for Assessing Proper Functioning Condition.*

U.S. Department of Interior, Bureau of Land Management, Utah State Office, Ecosphere Environmental Services, Farmington, New Mexico. 1997. *Grand Staircase-Escalante National Monument Noxious Weed Survey, Summary Report.*

U.S. Department of Interior, Bureau of Land Management, Utah State Office. 1997. *Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah.*

U.S. Department of Interior, Bureau of Land Management, Utah State Office, October 1991. *Utah Statewide Wilderness Study Report, Volume IIB-Summary Analysis of Study Area Recommendations.*

U.S. Department of Interior, Bureau of Land Management, Utah State Office, 1990. *Utah*

REFERENCES

BLM Statewide Wilderness Environmental Impact Statement, Final.

U.S. Department of Interior, National Park Service, 1997. *A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol.* Technical Report NPS/NAUCPRS/NRTR-97/12. Colorado Plateau Research Station, Northern Arizona University.

Utah Cooperative Fish and Wildlife Research Unit, 1995. *Utah Gap Analysis: An Environmental Information System.* Final Project Report 95-1. Utah State University, Logan, UT.

Utah Division of Parks and Recreation, Division of Natural Resources, 1992. *1992 Utah SCORP, Utah's State Comprehensive Outdoor Recreation Plan.*

Utah School and Institutional Trust Lands Administration. 1998. *State Oil and Gas Leases, and State Coal Leases.*

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
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